

THE MINING CONGRESS JOURNAL

OCTOBER, 1919

VOL. V

SAFETY—EFFICIENCY—CONSERVATION

No. 11



JOSEPH W. FORDNEY

Of Michigan, who has piloted several tariff bills through the House of Representatives

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

\$ 2.00 PER YEAR

20¢ PER COPY

Use the EDISON STORAGE BATTERY

Its strength and ruggedness will insure greater certainty in mine production. Use Edison Batteries

in *Mine* *Lamps*

The steel-and-iron construction of the Edison Battery gives great durability to the Edison Mines Lamp. It stands up in service. It gives ample, unfailing light. Successful use has made the Edison the Standard Electric Mine Lamp of America.

Ask for Bulletin 300-N



in *Battery* *Motors*

There's a big advantage in using the steel-and-iron Edison Battery. Then you can depend on your storage battery locomotives for steady, reliable service, day in and day out. You can depend on freedom from trouble. You can be assured of greatest production at lowest cost.

Bulletin 608-N on request

Edison Storage Battery Company

Factory and Main Office, Orange, N. J.

DISTRIBUTORS IN

New York
Seattle

Boston
New Orleans

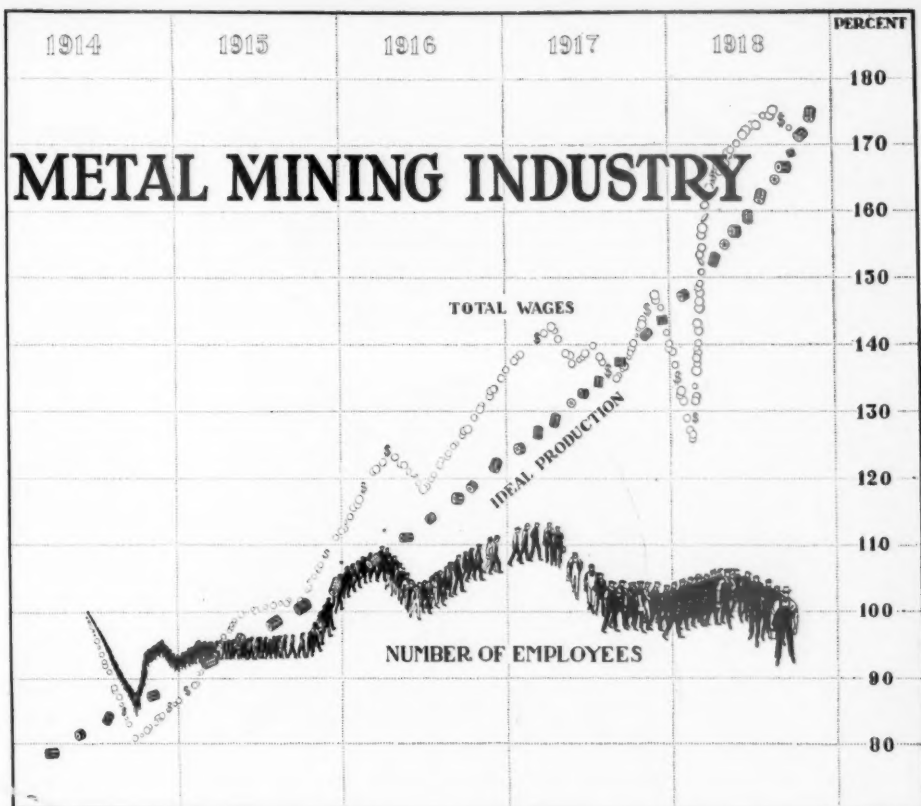
Chicago

Detroit
Pittsburgh

San Francisco
Kansas City

Los Angeles
Philadelphia

General Distributors of Edison Mine Lamps: Mine Safety Appliances Co., Pittsburgh, Pa.



Since 1914 the number of men in the Metal Mining Industry has actually decreased, while the wages these men receive have increased over 70%.

There is only one economical way to take care of this large increase in wages, and that is to make the same men more productive—to help them produce more ore without additional expenditure of effort.

The use of Hyatt Roller Bearings will give you easy running ore cars that will enable the same number of men to increase your production of ore and thus help offset the increase in wages.

Your manufacturer can supply you with Hyatt Roller Bearing equipped ore cars. Begin now to realize the oil, maintenance and power saving advantages of these cars in your own mines.

B376

Hyatt Roller Bearing Company

METROPOLITAN TOWER

NEW YORK CITY

HYATT BEARINGS FOR ORE CARS

“BULLDOG”

Rock Drill Steel

Hollow and Solid

Used Wherever the Best Is Needed

IN ALL SIZES



AND ALL SECTIONS

Manufactured only by the

INTERNATIONAL HIGH SPEED STEEL COMPANY

Main Office and Works:

Rockaway, N. J.

New York Office

294 Lafayette St.

REPRESENTATIVES:

Pacific Coast: Harron, Rickard & McCone, San Francisco, Cal.
Northwest States: Western Machinery & Equipment Co., Spokane, Wash.
British Columbia: E. G. Prior & Co. Ltd., Victoria, B. C.
Copper Range: Wm. G. Phillips, Houghton, Mich.
Eastern Canada: H. L. Osborne, Toronto, Can.
New England States: Carroll Steel Co., Boston, Mass.

THE MINING CONGRESS JOURNAL

OCTOBER

CONTENTS

1919

EDITORIALS

President's Industrial Conference.....	327
Annual Convention.....	327
Removal of Offices.....	327
Increased Production Great Necessity.....	328
Improving Labor Conditions.....	328
Nation's Unrest.....	329
Road to Industrial Slavery.....	330
Good Faith and Labor Contracts.....	330
Steel Strike.....	331
Unfortunate Illustration.....	332

METALS, ETC.

Anaconda Claim.....	334
Dyestuffs Bill.....	350
Fertilizer Materials.....	350
French Iron Situation.....	333
Gold and Silver Figures.....	348
Iron-making Bacteria.....	356
Magnesite, Austrian.....	355, 358
Magnesite Bill Passes.....	337
Magnesite Mines in Austria.....	337
Nitrogen Commission.....	349
Potash.....	350
Potash Production Analyzed.....	355
Saline Takes.....	350
Talc Production.....	350
Zinc Production.....	338

COAL AND OIL

Coal Miners' Demands.....	351
Coal Tar Bill Passed.....	350
Europe Needs U. S. Coal.....	336

Fuel Oil Market Easy.....	348
Gasoline Consumption.....	333
Gasoline Production Increased.....	355
Kerosene Exports.....	342
Kerosene Stocks Declining.....	356
Oil Consumption Less.....	348
Pennsylvania Costs.....	352
Petroleum Storage.....	347
Production at High Mark.....	337
Rice on European Mining.....	343
Statistics Needed.....	350
Texas Oil Production.....	342

MISCELLANEOUS

Arizona Conditions.....	355
Arizona Wage Scale.....	343
Bethune, John F.....	342
Cummins Bill.....	339
Energy Resources.....	354
Labor and the Market.....	344
Legal Decisions.....	356
Joyes, Col. J. W.....	349
National Legislation.....	357
Personals.....	358
Plumb Plan.....	339
Power Situation.....	344
Railroad Problem.....	339
Spurr, J. E.....	345
Tariff Commission Secretary.....	342
Tariff Situation.....	333
Tintic District Activity.....	355
Utah Camps.....	337

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

AWARDED



Americore

RUBBER COVERED WIRE

INTERIOR WIRING

ALL SIZES AND VOLTAGES

Every coil examined and labeled under the direction of the underwriters' laboratories. Ignition wire for autos, motor boats and aeroplanes.

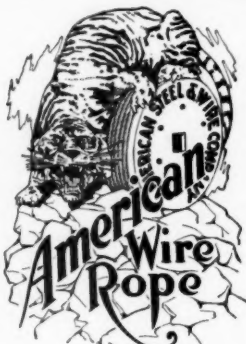
Send for booklet fully describing



We present these wires as the result of many years of exhaustive research and test under service conditions, assuring the greatest efficiency over the longest period of usage.

The specifications of this wire are adequate for the most extreme requirements of indoor use in high-class structures as well as for the most exacting outdoor exposure.

Send for booklet fully describing



For elevators, dredges, lumbering, mining, oilwell drilling, suspension bridges, stump pulling, cranes, derrick, shovels, rigging and every other form of wire rope use.

Ask for illustrated catalogue.

Read about wire rope usage in its different requirements in American Wire Rope News. Gladly sent free to anyone upon request.

AWARDED



Supreme Award of Merit

Made by

American Steel & Wire Company

Chicago
Pittsburgh

New York
Worcester

Cleveland
Denver

H. Channon Company

MINING SUPPLIES

CHICAGO, ILLINOIS

♦ ♦ ♦

Filter Cloths
Machinery
Contractors Equipment
Heavy Hardware
Manila and Wire Rope
Machinists Supplies
Mechanical Rubber Goods

Brattice Cloth
Belting, Packing and Hose
Tents
Manufactured Canvas Goods
Twines and Cordage
Engineers Supplies
Mill Supplies

♦ ♦ ♦

GRIPWELL AUTO TIRES

Unexcelled Service

Dependable Merchandise

New Catalog now ready. Send for your copy



SAFETY FOR THE “MAN TRIP”

The moment the signal is given for “man trip” a safe speed for the hoist is automatically set by the VULCAN Partial Speed Rig—independently of the operator who cannot increase the speed of the hoist until after the trip is completed.

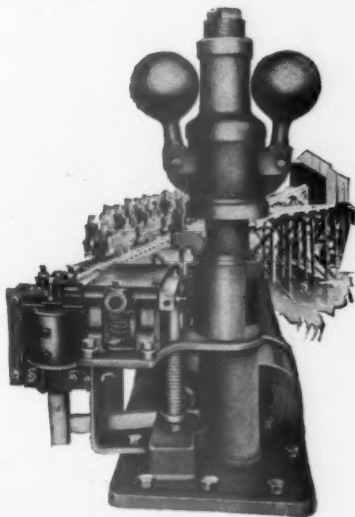
The VULCAN Partial Speed Rig is only one of the safety features of VULCAN Hoists. There are thirty-three others.

Correspondence Invited

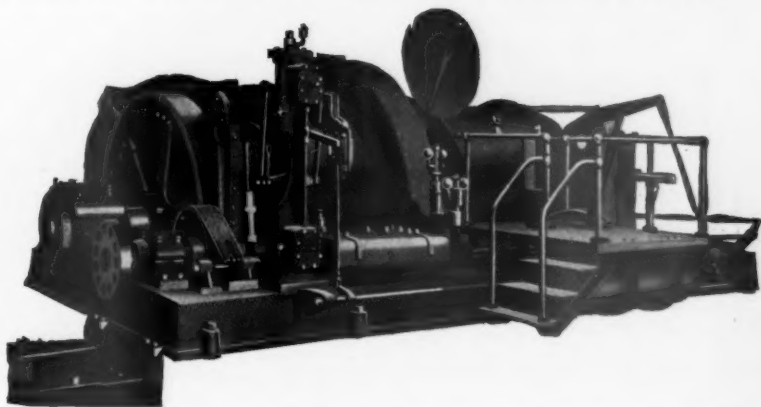
Vulcan Iron Works

Designers and Builders of Hoists

1736 Main St. WILKES-BARRE, PA.



VULCAN PARTIAL SPEED RIG



The fifth in this series of eight articles on the safety features of VULCAN HOISTS will appear in the December issue of this magazine.

THE CHURN DRILL IN MINING OPERATIONS



Prospecting for Coal in the Anthracite Regions

handles a wide range of conditions. For the past twenty-five years Cyclone Drills, equipped with Cable and Hollow Rod tools, have been used for:

- prospecting for minerals such as coal, iron, low-grade copper, lead and zinc.
- drilling blast holes for mining ore by the quarry or open-cut method.
- drilling blast holes for stripping the overburden from the ore-bearing deposits.
- drilling holes into mines and shafts for ventilation purposes, for the introduction of electric, air and steam lines, and for pumping water out of the flooded areas.
- and for many special conditions where other equipment had failed.

Cyclone Drills are built in traction and non-traction styles with gasoline, steam or electric power.

A postal to us will bring you literature and our Data Sheet No. 5, which will make it possible for us to help you.

THE SANDERSON-CYCLONE DRILL CO.
ORRVILLE, OHIO

EASTERN AND EXPORT OFFICE: 30 CHURCH STREET, NEW YORK, N. Y.

CORE DRILLING

H. R. Ameling Prospecting Co.

DIAMOND DRILL CONTRACTORS

Boatmen's Bank Building

ST. LOUIS, MO.

Efficient Hoisting Operation

INLAND COLLIERIES CO.

INDIANOLA, PA.

700 HP. Type CW Westinghouse Motor
operating balanced shaft hoist.

Depth of shaft - - - 315 ft.
Weight of loaded cage, 25600 lb.
Trips per hour - - - 150
3500 tons - - - - - 7 hours

WESTINGHOUSE ELECTRIC & MFG. CO.

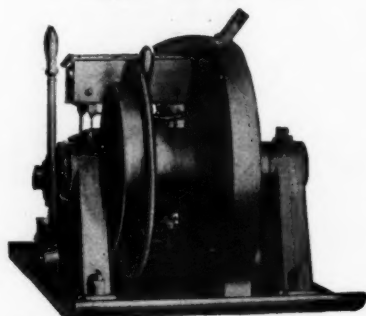
East Pittsburgh, Pa.



Westinghouse

Pneumelectric
TRADE MARK

For
Handling
Cars
Any
Place



Made in
Single
and
Double
Drum

5-Horsepower Electric Hoist.

Specially adapted for use in and about the mines.

We also manufacture electrically operated Rock Drills, Coal Punchers,
and Gathering Pumps.

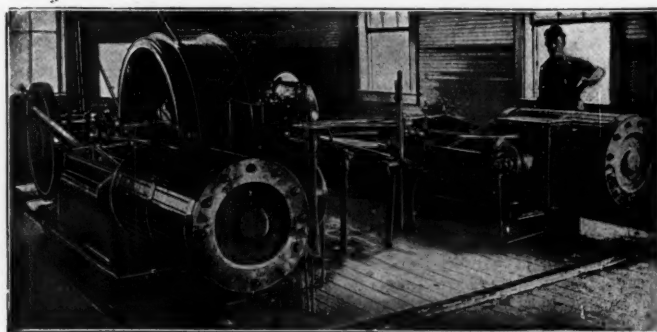
Full information furnished on request.

THE PNEUMLECTRIC MACHINE COMPANY
SYRACUSE, N. Y.

ROBT. HOLMES & BROS., Inc.

Successors to DANVILLE FOUNDRY & MACHINE CO.

Corner North and Hazel Streets, Danville, Ill.



MANUFACTURERS OF

Danville Hoisting and Haulage Engines, both Light and Heavy Duty Type, first and second motion.

Halbert's Patent Self Dumping Cages.

Plain Cages.

Holmes' Shaker Screen.

Holmes' Telescoping End Loader.

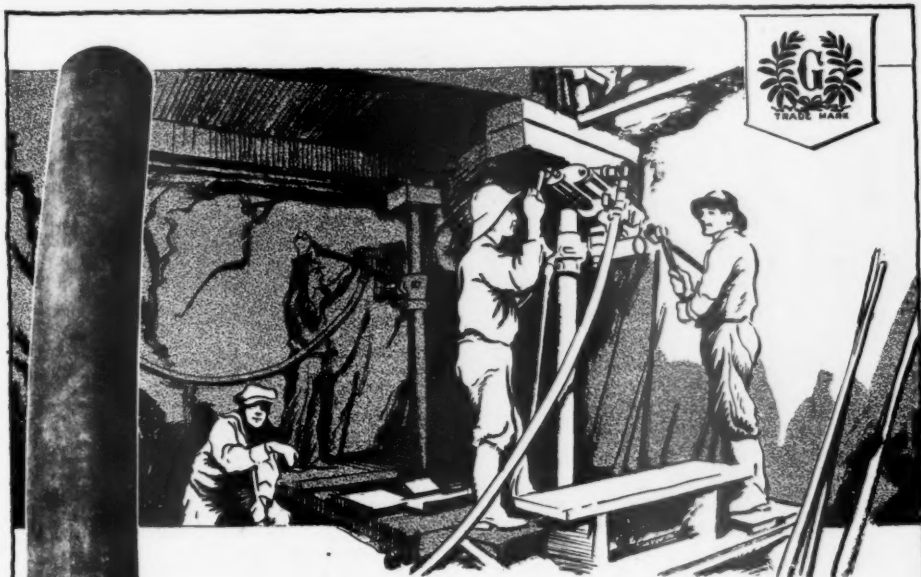
Holmes' Patent Weigh Hopper.

Holmes' Automatic Car Lifts for mine bottoms.

Iron, Bronze and Brass Castings of all description.

Heavy Iron and Steel Forgings.

All kinds of Plate Metal Work, particularly for coal mines.



FULL MEASURE

Goodrich Air Hose never starves the drills—it delivers full measure of air all day long. It can be depended upon to maintain a steady pressure. No kinks. No leaks. Oil-proof, fool-proof, and able to withstand all the abuse of man and mine.

Goodrich Air Hose is used in mines throughout the world and wherever it goes it stays down. A sample will be sent on receipt of your postal.

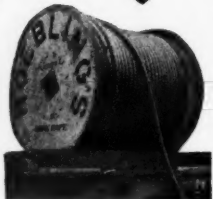
THE B. F. GOODRICH RUBBER COMPANY

The City of Goodrich—Akron, Ohio

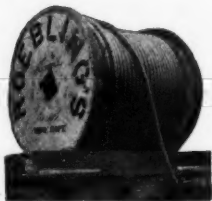
*Goodrich De Luxe
Truck Tires ride
easier; wear longer;
run faster without
damage to tire and
truck; help save
engine power and
fuel.*

GOODRICH AIR HOSE

Roebbling Wire Rope



*Trolley Wire, Copper Wire,
Duplex Cable*



*Locomotive Cable,
Concentric, Twin*



*Car Cable, Mine Lamp Cord,
Wire Rope Fittings*

JOHN H. ROEBLING'S SONS COMPANY, Trenton, New Jersey

New York
Atlanta

Boston
San Francisco

Chicago
Los Angeles

Philadelphia
Seattle

Pittsburgh
Cleveland
Portland, Ore.

Mine Ropes

OF QUALITY
for
HOISTING, HAULAGE or SLOPE
also
PATENT "KILINDO"
NON-ROTATING

Wire Rope

FOR SHAFT SINKING.
Sole Makers
MONARCH PATENT
MINE CAR HITCHINGS
Adaptable to any System
Haulage. Absolutely Safe

**Macomber & Whyte
Rope Co.**

RACINE AVENUE
KENOSHA, WISC.

HAZARD WIRE ROPE

INSULATED
WIRES & CABLES



HAZARD MFG CO
WILKES-BARRE PA

NEW YORK PITTSBURGH CHICAGO
833 CANAL STREET 187 NAT'L BANK 862 W. ADAMS ST

COAL

American industries are today almost wholly dependent upon the *Coal Mining Industry*.

Perhaps there is no question before the American people which more vitally affects each individual than that of *Coal*.

As a war necessity Congress nationalized our *transportation* system. The result is a deficit that is appalling, and is one which means dollars in taxation to the people of the country.

There are a few who would nationalize our coal mines. These few are busy spreading their propaganda.

The great mass of American people is guided in its thinking by the genius who attracts their eyes with statements that are extravagant and founded but on half a truth.

They do not stop to analyze these facts:

Coal is *the* essential in modern industrial life.

Coal is *the* basic American industry.

Coal is *the* basis of 1500 branches of industry.

National control necessarily means political control.

If the coal mines are nationalized the bolshevist element could completely demoralize these 1500 American industries, with their strike system, and the great unprotected public would be at the mercy of the few who are in power.

The American Mining Congress

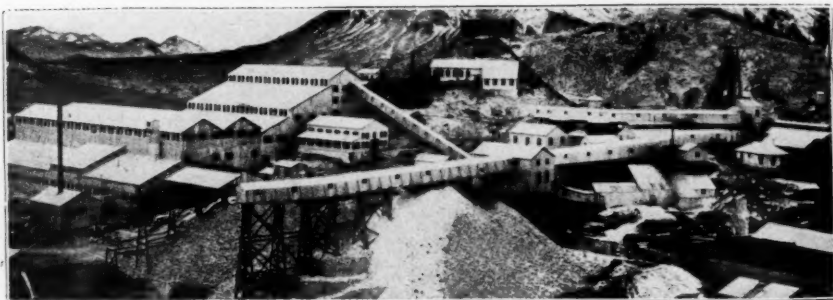
is alive to the great questions that are today facing coal operators. Are you familiar with its position upon this vital subject? Do you know what it is doing to help meet the situation?

ADDRESS:

Washington Headquarters, Munsey Building

For Information

Allis-Chalmers Manufacturing Co.



Allis-Chalmers machinery forms the major part of the equipment of very many large milling plants; it is reliable because it is "built for service."

Milwaukee

Wisconsin

Sales Offices in Principal Cities



100% EFFICIENT!

It is a patriotic duty as well as a financial necessity to buy the mining equipment that will stand the greatest strain, in these days of speed.

LET GOODIN-REID BRATTICE SOLVE YOUR EFFICIENCY PROBLEM

RED DIAMOND EVERLASTIC BRATTICE is coated with a special Water and Air-tight Compound that resists hard wear and increases its life. It is thus Mildew, Water and Flame-proof.

RED DIAMOND BRAND BRATTICE is guaranteed Mildew and Flame-proof.

EVERLASTIC BRAND BRATTICE is Water and Mildew-proof.

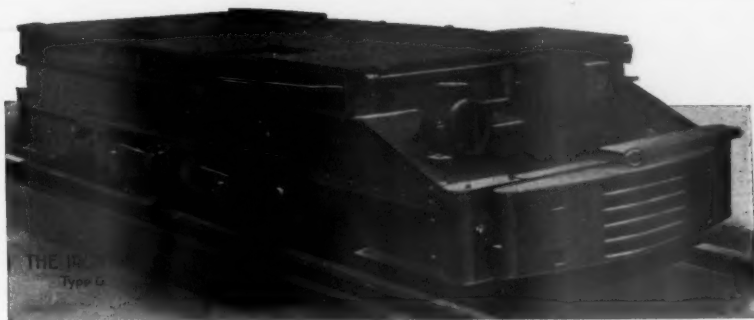
SERVICE, PLUS SATISFACTION, DEPENDABILITY, DURABILITY.

Allow us to send you samples.

GOODIN, REID & COMPANY, CINCINNATI

43 Leonard Street, New York, N. Y.

987 Union Arcade, Pittsburgh, Pa.



400 Tons hauled in 14 hours against a 4% grade Without Recharging the Battery

This performance shows what the Ironton Storage Battery Locomotive will do in an emergency. The record was made in a large Kentucky operation, where this 5½ ton Type D Locomotive has displaced six mules and is gathering and hauling about 300 tons daily. The average tonnage delivered by the mules was about 200 tons. Average haul 800 feet.

Ironton Locomotives are built in four types, and in weights ranging from 3 to 8 tons—and meet all practical mining conditions.

Our Sales Engineers are prepared to tell you what performance Ironton Locomotives will give in your mines.

Write for full information and new catalog

THE IRONTON ENGINE COMPANY, Ironton, Ohio

Branch Offices—584 Union Arcade Bldg., Pittsburgh, Pa.; Chicago Office, 735 Old Colony Bldg.; 408 Gas & Electric Bldg., Denver, Colo.; 1116 Fidelity Mutual Bldg., Philadelphia, Pa.; 2615 N. 4th St., Columbus, O.; 1108 Fayette National Bank Bldg., Lexington, Ky.; Keiser-Geisner Engineering Co., Birmingham, Ala.; Colman Bldg., Seattle, Wash. Canadian Representative, Chas. E. Goad Engineering Co., 105 Bond St., Toronto.

4 Types	THE IRONTON STORAGE BATTERY LOCOMOTIVES	3 to 8 Ton Sizes
--------------------	--	---------------------------------

United Metals Selling Company

42 Broadway, New York

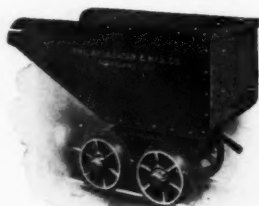
European Agents:

C. S. Henry & Company, Ltd.
12 Leadenhall St., London, E. C.

Electrolytic Copper
Best Selected Copper
Pig Lead—Desilverized Common
and Corroding
Electrolytic Zinc
Highest Grade and Purity

N E C & B M Brands
A B S & M A Brands
International (I. L. R. Co.)
Anaconda Electric

*Selenium, Arsenic, Nickel Salts, Tellurium
Copper Sulphate*

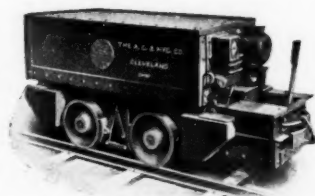


No. 261
Rotary Scoop Car

Mine Equipment

**Storage Battery
and Trolley**

Locomotives



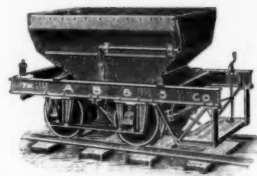
No. 5730
Storage Battery Mine Locomotive



No. 6700
Electric Locomotive for Industrial
and Freight Service

Cars Track Switches

**Complete
Industrial
Railway Equipment**



No. 150-A
Bottom Dump Ore Car

THE ATLAS CAR AND MFG. CO.
ENGINEERS *Cleveland, Ohio.* MANUFACTURERS

**No matter what it is--
The Morse Silent Chain
Drive will run it efficiently
From 1-4 to 5000 H.P.
They Make Good**

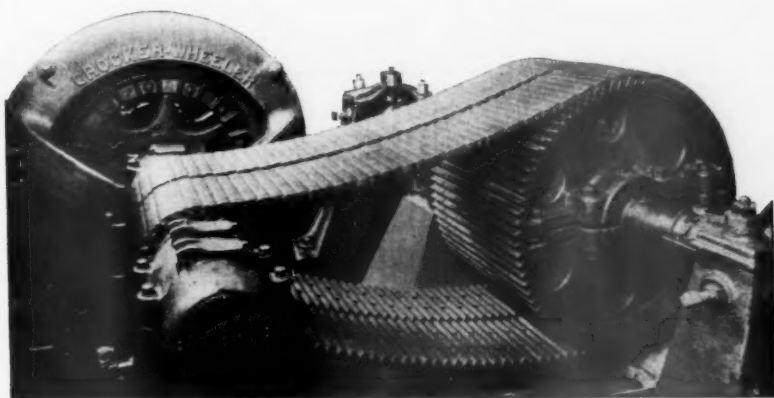


At your own mine with your labor problem becoming more important every day you cannot afford to overlook opportunities to remove equipment that requires constant attention when equipment can be secured that will require little or no care and will work more efficiently.

Morse Silent Chain Drives where you now have belts and gears will eliminate worry, attention, trouble, slippage and power loss. Morse Silent Chain Drives on your belt-driven fans, on pumps, in the machine shop; in fact, anywhere that a drive is needed that is not direct connected will lighten the burden of the mine operation and insure the full utilization of the driving power.

Morse Silent Chain Drives eliminate alignment troubles in many cases of troublesome direct connections.

Don't wait, write now to our nearest office for advice from our competent engineers.



SUPERINTENDENTS AND ENGINEERS SEND FOR DATA BOOK

MORSE CHAIN CO.

Ithaca, N. Y.

Boston, Mass. 141 Milk St.
Chicago, Ill. Merchants L. & T. Bldg.
Cleveland, Ohio. Engineers' Bldg.
Detroit, Mich. 1003 Woodward Ave.
Greensboro, N. C. 805 Ashboro St.
New York. 50 Church St.
Hudson Terminal Bldg.
Pittsburgh, Pa. Westinghouse Bldg.
San Francisco, Cal. Monadnock Bldg.
Atlanta, Ga. 702 Candler Bldg.
Earl F. Scott, M. E.

Canada Jones & Glasco, Regis'd
Montreal, St. Nicholas Bldg.
Toronto, Bank of Hamilton Bldg.
Kansas City, Mo. R. A. Long Bldg.
Morse Engineering Co.
Minneapolis, Minn. 413 Third St.
Strong-Scott Mfg. Co.
St. Louis, Mo. Chemical Bldg.
Morae Engineering Co.

PETROLEUM

The oil reserves of the country are being depleted at an alarming rate.

New uses for petroleum are being discovered daily.

Do you know what is being done to meet the situation?

THE LEASING BILL will open to development large areas now not available.

THE OIL SHALE BILL will help to demonstrate whether we may depend upon shale for assistance.

THE AMERICAN MINING CONGRESS is devoting a portion of its time to the solution of the problems of the oil industry.

DO YOU KNOW what it did to help you in taxation matters?
what it *is* doing about transportation problems?
what it *is* doing and *can* do to assist you?

FIND OUT

Address: Munsey Building, Washington, D. C.

Saving 57 Seconds Every Minute

That's what this Model 110 Waugh Drill Steel Punching Machine does, punching holes in hollow steel when it is substituted for hand work.

It means more time for the blacksmith, more steel for the mine, less trouble, less expense, and better, straighter holes—always.



Bigger mines, demanding better blacksmithing, equip their shops with this machine.

Eventually you will equip your shop with it.

Write for our bulletin No. 10-V-K. It will interest you.

THE Denver Rock Drill Manufacturing Co.

DENVER, COLORADO

Thews are Everywhere



THEW Electric Mining Shovels

for Underground Mining, Pit and Stock pile, Loading or Stripping

We offer a complete line of Revolving Power Shovels up to 2-yard dipper capacity, and equipped for Electric, Steam, Compressed Air or Gas Engine Operation.

Send for Complete Descriptive Catalogue.

THE THEW AUTOMATIC SHOVEL COMPANY
LORAIN, OHIO
New York, 30 Church Street Chicago, Monadnock Block

THEW Power Shovels

EXPORT DEPARTMENT
ALMACOA ALLIED MACHINERY COMPANY OF AMERICA ALMACOA
51 CHAMBERS ST. NEW YORK, U.S.A. CABLES ALMACOA NEW YORK

The Equitable Powder Manufacturing Company

Alton Blasting Powder

Alton High Explosives

Black Diamond Permissibles

FUSE **CAPS**

and

Miscellaneous Supplies

MILLS

Fort Smith, Ark., East Alton and Marion, Ill.

General Offices, East Alton, Ill.

Manufacturers of

“National” Brands Safety Fuse

For use in all mining, quarry
and agricultural blasting

THE

**NATIONAL FUSE & POWDER
COMPANY**

Office and Factory

DENVER

COLORADO

MINE SCALES

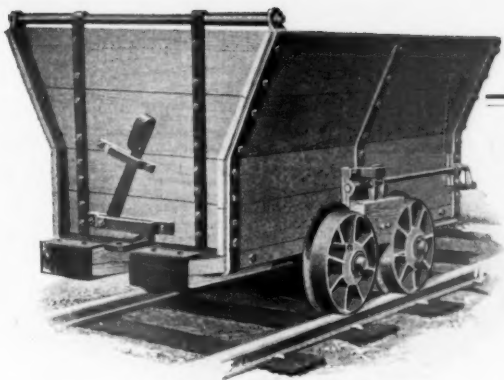
We Manufacture All Sizes of Heavy Scales From One to 300-ton Capacity

“The Standard” Scales are strictly high grade throughout, both in material and workmanship. During an experience of over a quarter of a century, we have installed scales for many of the largest mining, manufacturing and railroad companies of the country, as well as for the U. S. Government.

Send to our nearest office today and ask for Catalogue No. 83

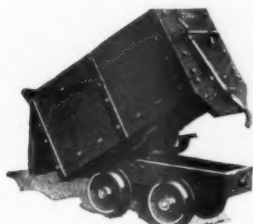
THE STANDARD SCALE & SUPPLY CO.

Pittsburgh New York Philadelphia Baltimore Chicago Cleveland
1631 Liberty Ave. 145 Chambers St. 523 Arch St. 409 N. Gay St. 161 N. May St. 1547 Columbus Road



No. 434-M

The Largest Car Builders in the World



No. 1128-M

Do you realize what this means? To buy cars from the largest builders in the world is to buy from an organization with the most highly perfected organization—from an institution that can buy at rock bottom prices and consequently give you most for your money.

WATT Cars have made our plant the largest by their consistently satisfactory work. And we have made WATT Cars satisfactory by building cars to measure only.

In planning for a plant, we consider the proposition carefully and build WATT Cars to exactly meet requirements.

**THAT'S
WHY WATT CARS
CANNOT HELP BUT MAKE GOOD**

The Watt Mining Car Wheel Co.
Barnesville, Ohio, U. S. A.

San Francisco:
N. D. Phelps,
Sheldon Bldg.

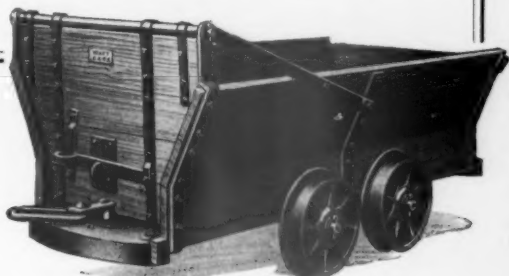
Denver:
Lindrooth, Shubart & Co.
Boston Bldg.

Philadelphia:
Edelen & Co.,
235 Commercial Trust Bldg



No. 1013-M

**Remember—We make
every type of cars.**



No. 1082-M

TRANSPORTATION

THE total railroad operating deficit for 18 months, ending June 30, 1919, amounted to \$500,000,000, *or \$5.09*, for every man, woman and child in the United States.

THE deficit exceeds the combined cost of the Revolutionary and Spanish wars by more than \$8,000,000.

THE total operating revenues for 1918, as compared with 1917, increased 22.4 per cent, while the total operating expense increased at nearly twice that rate--or 41.6 per cent.

THE passage of the Adamson Bill added nearly \$65,000,000 to the pay roll of the railroads.

THE actual work output of railroad labor per man employed, or hour worked, declined steadily in 1918, when it should have increased with the larger volume of traffic.

THESE ARE FACTS

Compiled and Vouched for by

The American Mining Congress

Address: Munsey Building

Washington, D. C.

9 Good Reasons for Electrical Blasting



- 1.—With an electric blasting machine you can fire from one to one hundred and fifty charges simultaneously.
- 2.—Electrical blasting allows better tamping and fullest confinement of the gases.
- 3.—Fuller development of the explosive force with consequent greater shattering.
- 4.—Less smoke and fumes and quick return to the working face.
- 5.—Better results with smaller quantity of explosive, therefore cheaper.
- 6.—With the rheostat and galvanometer the electric connections can be tested to assure detonation and to avoid misfires.
- 7.—The shot-firer stands at a safe distance and does not operate the blasting machine until everyone is out of the danger zone.
- 8.—There is no need of matches, torches or open flame for detonation of explosives where electrical blasting is practiced.
- 9.—The dependability of Du Pont electrical blasting equipment, that leaves nothing to chance, but gives the operator control of the entire blasting performance. Du Pont blasting accessories are correct in design and efficient in service. They are the result of practical experience and scientific research—the last word in modern, sure-fire blasting equipment.

A free copy of our Blasting Supplies Catalog will prove helpful. Write for it today to Advertising Division.

E. I. du Pont de Nemours & Co.

Powder Makers Since 1802

Wilmington

Delaware

The Principal Du Pont Products Are:

Explosives: Industrial, Agricultural and Sporting. **Chemicals:** Pyroxylin Solutions, Ethers, Bronzing Liquids, Coal Tar Distillates, Commercial Acids, Alums, etc. **Leather Substitutes:** Fabrikoid Upholstery, Raynite Top Material, Du Pont Rubber Cloth. **Pyroxylin Plastics:** Ivory, Shell and Transparent Py-ra-lin, Py-ra-lin Specialties, Challenge Cleanable Collars and Cuffs. **Paints and Varnishes:** For Industrial and Home Uses. **Pigments and Colors:** For Industrial Uses. **Lithophone:** For Industrial Uses. **Stains, Fillers, Lacquers and Enamels:** For Industrial and Home Uses. **Dyestuffs:** Coal Tar Dyestuffs and Intermediates.

For full information address:

Advertising Division, E. I. du Pont de Nemours & Co., Wilmington, Del.

Visit Du Pont Products Store when in Atlantic City

DU PONT

RELIANCE LEATHER BELTING

Greater PRODUCTION is the one remedy for the economic problems which are uppermost in every land today—Production; top speed, head on, in every plant.

RELIANCE LEATHER BELTING has a clean record of performance in plants where it has been installed. Selected material, thorough preparation and the experience and workmanship of more than a quarter of a century insure its capacity for power transmission of every day load or emergency overload.

Chicago Belting Engineers are frequently called in to equip entire plants with proper belts; to solve particularly difficult drive-problems. Our engineering department is ready at all times to serve you without obligation.

*Write for free catalog and data book
—of interest to all users of belting*

Chicago Belting Company

New York
Cleveland
Rockford, Ill.
New Orleans

102 North Green Street
CHICAGO, ILL.

Los Angeles
San Francisco
Seattle, Wash.
Portland, Ore.



Explosives



for every blasting
requirement



for

Road Building
Excavating
Ore Mining
Coal Mining
Quarrying
Demolition
Agriculture

Atlas Explosives are manufactured with specific characteristics for different classes of work. The various Atlas brands differ in strength, quickness, sensitiveness, resistance to cold, fumes involved on detonation and resistance to water, according to the requirements of the work for which the explosive is to be used. The qualities most needed in one class of work may be worthless or actually derogatory in another.

To insure Atlas users getting the best results with the greatest economy of time, labor and money, we maintain the Atlas Service Division. Here is a corps of experts who are thoroughly conversant with the exact properties of every explosive and the most efficient methods of using them.

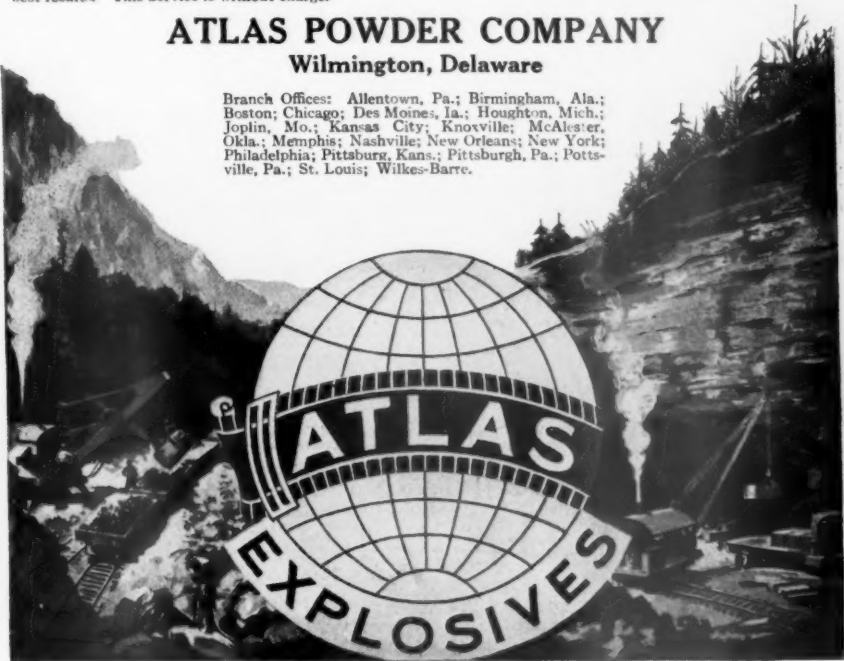
When you are in doubt on any question pertaining to explosives write and explain your troubles to our Service Division. They will give you the correct solution to your problem and, if necessary, will send a specialist to determine just what methods you should use to get the best results. This Service is without charge.

More than 100 Different Kinds

Dynamite
Permissible Explosives
Gelatin Dynamite
Blasting Gelatin
Extra Dynamite
Oil Well Explosive
Quarry Powder
Farm Powder
Low Powders
Blasting Powders
Sporting Powders
Blasting Supplies

ATLAS POWDER COMPANY Wilmington, Delaware

Branch Offices: Allentown, Pa.; Birmingham, Ala.; Boston; Chicago; Des Moines, Ia.; Houghton, Mich.; Joplin, Mo.; Kansas City; Knoxville; McAlester, Okla.; Memphis; Nashville; New Orleans; New York; Philadelphia; Pittsburg, Kans.; Pittsburgh, Pa.; Pottsville, Pa.; St. Louis; Wilkes-Barre.



To Our Members:

THE VALUE of advertising is measured by the result it produces.

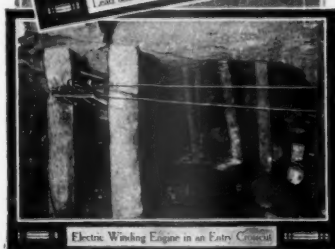
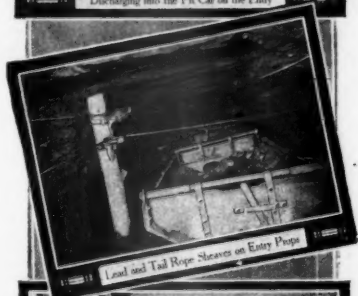
The advertisers in THE MINING CONGRESS JOURNAL are concerns of the highest standing. We, as an organization, are willing to endorse their products.

They have a double purpose in advertising in THE MINING CONGRESS JOURNAL. **First:** They believe that the best results can be obtained by presenting their product directly to the men who purchase equipment. **Second:** They realize that the work being done by The American Mining Congress is important to them as well as to the operator.

Their advertisements are appearing regularly in the JOURNAL. The equipment they produce warrants your investigation if you are in the market for their products. Give them an opportunity to bid upon your requirements.

THE AMERICAN MINING CONGRESS

GOODMAN SCRAPER LOADER



Working in Low Coal

Here the Scraper Loader enables a large mining company in Pennsylvania to work out a territory of low coal which otherwise could not be mined economically.

The coal is 28 inches thick, beneath 4 inches or more of draw slate, which comes down usually in large blocks, and is easily gobbled back.

Working height is, therefore, only 32 inches in the rooms, with only 28 inches at the face before the slate is drawn.

Rooms are 40 feet wide, opened by two necks—one at each side. The car-loading chute is placed in one neck, and the tail rope of the Loader enters the other.

Two rooms of this width keep the Loader busy, one being cut and shot while the other is loading out.

Operation of the Loader is rapid, and the coal is loaded out at costs which compare favorably with work in higher places.

Have you a difficult situation in which one of these outfits might be of valuable service? If so, let us go into it carefully with you and see what can be done.

GOODMAN MANUFACTURING COMPANY

PITTSBURGH

NEW YORK

CINCINNATI

48th to 49th Streets on Halsted

CHICAGO, ILL.

CHARLESTON, W. VA.

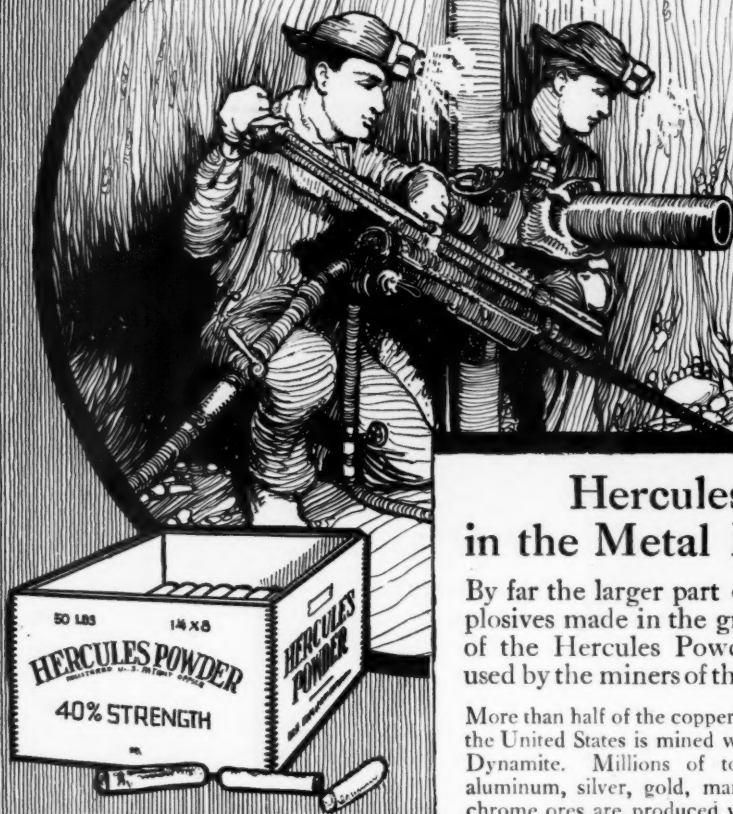
SEATTLE

BIRMINGHAM

ST. LOUIS

DENVER

HERCULES EXPLOSIVES



Hercules in the Metal Mines

By far the larger part of the explosives made in the great plants of the Hercules Powder Co. is used by the miners of the country.

More than half of the copper produced in the United States is mined with Hercules Dynamite. Millions of tons of iron, aluminum, silver, gold, manganese, and chrome ores are produced with the help of Hercules Explosives.

These facts should be significant to you and to every mine owner or operator. They are evidence that points conclusively to the efficiency and economy of using Hercules Explosives.

HERCULES POWDER CO.



Chicago
Pittsburg, Kan.
San Francisco
Chattanooga

St. Louis
Denver
Salt Lake City
Pittsburgh, Pa.

New York
Hazleton, Pa.
Joplin
Wilmington, Del.



Swaying, vibrating, anthracite breakers, or wet mining machinery, heavily shocked steel mill machinery and roughly jerked logging engines require hardy, super-strong, well insulated motors.



The Rough Work Motor

H. I. Motors were made to do the rough work of life. Miners, lumberjacks and steel mill operators were in on the tryout and all of them adopted them for their own.

Their hardihood through many years of service is due to super-strong construction in which nothing is left to chance. Rotor connections between bars and end rings are all welded at the points shown by the arrows. A cross section shows the material at the weld is stronger and of better conductivity than the bars themselves.

H. I. Motors are widely used and have been in successful operation for years under the most severe conditions.

Our specialists will be pleased to supply fullest details

General  **Electric**
General Office **Company** Schenectady, N.Y.

43-202



S-A Unit Ball Bearing Conveyor Carrier

It's All Steel
It's Ball Bearing
It's Correctly Designed
It's Well Built
—*it's right*

▼
Stephens-Adamson Mfg. Co.
AURORA, ILLINOIS

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

THE PRESIDENT'S INDUSTRIAL CONFERENCE

The conference of the various factors of industry—capital, labor and the consumer—which has been called by President Wilson, should result in a vast benefit to the nation. The waste of strikes of the past has been enormous. The bad feeling which has grown out of conflicts between labor and capital has caused perhaps even greater loss. That labor and capital should work together in perfect harmony, each receiving its just reward in proportion to the service rendered, and that the enlarged production should be available for the great body of consumers at prices which will enable a large use and thus call for additional activities of the combinations of labor and capital, would be an ideal condition. This condition would bring the greatest amount of luxuries and comforts as well as of necessities to the public as a whole. Without this coordination some people must suffer want and many people go without luxuries and perhaps struggle for necessities. It is not to be humanly expected that a solution of all these problems can be worked out at the President's conference. It is to be hoped that a long step will be made in that direction.

ANNUAL CONVENTION

As has already been announced, the Twenty-Second Annual Meeting of the American Mining Congress will be held at St. Louis for five days, beginning November 17. Each branch of the mining industry will have opportunity for

the special discussion of its particular problems, and general meetings will be held at which matters of common interest will be discussed.

Many of the most prominent men in the nation will be in attendance, and an exhibit of mining machinery and supplies of mining resources and of the many new applications of science to mining development will be available for study and amusement.

The St. Louis Special Committee of Arrangements consists of Messrs. Thomas F. Brewster, W. L. Schmick and W. K. Kavanaugh, three men whose names give most complete assurance that the city of St. Louis is behind the movement, and that no pains or expense will be spared to make this convention a notable success.

REMOVAL OF OFFICES

We beg to announce to our members and friends the removal of our Washington headquarters from the seventh to the eighth floor of the Munsey Building.

The change is made necessary by the need for increased space. The new headquarters will occupy nearly double the space which has been occupied in the past.

In addition to increased space for the use of our working force, a special room will be provided for the use of our members, which will at all times be available for that purpose.

With the increased facilities thus provided, the Mining Congress will be able to render more complete service to the mining industry, and will not only be

willing, but solicits the opportunity to care for the interests of its members in Washington, no matter what the particular service required may be.

We may fail in meeting some requests, but will at least make a strenuous effort to serve the mining fraternity of the nation in whatever matters require attention in the capital of the nation.

THE NATION'S UNREST

Much is being said concerning the general unrest among the people of this nation and of the world. The war has created new conditions which require readjustment, and whether this adjustment is to be made upon the present high-price levels or upon the levels of the pre-war period is the question which cannot be answered or determined by any theoretical discussion. Whether prices are high or low is not important. It is important that the prices of all things shall be upon equal levels.

The wage-earner who earns four dollars a day and is able to support his family with three dollars, leaving him one dollar of profit, is as well off as the man who earns ten dollars a day, whose living requires the expenditure of nine. In fact, he is better off because the surplus dollar is worth more than is the surplus dollar in the high-price market.

Price levels depend upon two considerations: First, whether the amount of production is a little more or a little less than the demand; second, upon the amount of money available for its purchase. The first relates to the willingness of the world's workers to make full production, and the second depends upon the amount of money available for use.

The circulating medium of any country with international interests must be based upon the amount of its metallic currency. To secure normal conditions, the business requirements for the use of money, the amount of money in circulation and the amount of gold, which is the basis of security for that medium, should bear as nearly as possible a stable relation to each other.

At this time the amount of gold used in jewelry and for manufacturing purposes is rapidly increasing, the production of

gold is rapidly decreasing, and the currency which is based upon the gold reserve is rapidly increasing.

Upon the other hand, the amount of goods being used by the public is greater than ever before, while the industrial forces of the nation and of the world are curtailing production. This is the real reason for world unrest. The only solution of the problem is increased production.

IMPROVING LABOR CONDITIONS

Notwithstanding the labor unrest throughout the country, the fact remains that the conditions of labor have been vastly improved during the past twenty-five years. To an extent organized labor is entitled to credit, but it is undoubtedly true that more of credit belongs to the advance of civilization, the increased use of machinery, and the larger operations made possible by capital. These have so increased production as to bring to the wage-earners luxuries which were then unheard of and which today have come to be regarded as necessities.

That labor should strive to receive its full share of the benefits of production is laudible, even though it may be difficult to ascertain just what that share is. Labor's opposition to the introduction of labor-saving devices is most shortsighted, as the present high-priced era most thoroughly demonstrates. Wheat cannot be eaten until it is raised; manufactured products cannot be used until they are made; the price of the necessities and luxuries of life depend upon the certain operation of the law of supply and demand. Sometimes profiteers and speculators temporarily interfere with the natural operation of this law, but these can never effect permanent interference, except where the production is based upon a limited supply of materials wholly or largely controlled by profiteers, who are able, because of a monopoly, to maintain prices above a proper level. Even these efforts are more or less abortive, because there is no one necessity for which there are not partially satisfactory substitutes. When the price of wheat is too high, corn, oats,

or rice are substituted, and frequently the substitutes gain such favor as to thereafter prevent the cornered substance from finding a profitable market. There are few substances the production of which can be so controlled that the high price will not stimulate increased production by other agencies. The surest promise of plenty is guaranteed by an overstocked market. Shortening of production means an understocked market; whether that under-supply is brought about by a failure to use the best means of production, by a failure of labor to perform full service, or by its refusal to perform any service. The best means of production include efficient labor, complete facilities and the best equipment and, not less important, that supervision which brings each component element of production into that relation where its service is most effective. A high level of prices must prevail when these elements of production are not properly coordinated. The better this coordination, *i.e.*, the more efficient the operation, the larger the production, the larger the supply upon the market, the lower the price, and the greater the amount which will be available and within reach of the wage which labor earns in its part of the enterprise. Just what this part should be will ever be a mooted question and yet one which can at any time be approximately ascertained. Every business concern should, and most of them do, through proper accounting systems, ascertain the exact part of the earnings to be credited to each of the three necessary elements of production.

Labor cannot accomplish full production without the cooperation of capital and management. Labor may secure capital by paying capital's wage, the interest rate which is regulated by law. Capital may purchase labor by mutual agreement not regulated by law, except in certain instances as to the minimum wage which is required. Capital always seeks the highest efficiency. Very unfortunately, labor sometimes seeks the highest inefficiency without realizing that its own interest is jeopardized thereby. Whether the market shortage is created by inefficiency, by a lack of

proper capital, by mismanagement, or by labor strikes, the result is the same to all consumers, namely, a high price. This leads to a diminished use, which in turn curtails the demand for labor and in the end leads to unemployment.

INCREASED PRODUCTION THE GREAT NECESSITY

It is a matter of special interest at this time to know that in Germany it has been concluded that a ten-hour day offers the best solution to the industrial problems which face that nation.

Germany, at the close of the war, found herself impoverished, but not more so than the European Allies with which her contest was waged, except for the indemnities which will be required under the terms of whatever peace treaty shall be finally concluded.

The costs of army maintenance by France and Great Britain per unit of fighting efficiency was very much greater than the same costs to Germany. Upon the same basis, the cost of industrial production will be very much less in Germany.

In order that these developments may be accentuated, and in order that the productive forces of Germany may be so marshalled as to meet the enormous burden of indemnities and to build up her industrial powers in the shortest space of time, Germany has about concluded to put her workmen upon a ten-hour basis and that the Government shall pay a special bounty for the extra hours of service performed by each working man.

Of all the lessons which Germany has taught the world, and these are many, perhaps none would be of greater service to the remaining world forces at this time than the particular lesson involved in this conclusion.

Increased production is essential to make good the shortage of the world's supplies created by the war waste. Nine hours per day of honest labor for a six months' period in the United States would solve most, if not all, of the problems of high prices and the necessity for higher wages in order to meet living expenses.

We are now producing in an eight-hour day and with much "soldiering" the food which this nation requires, and we are sending approximately twenty millions of tons of foodstuffs to Europe. If this surplus food had been placed upon our own markets, price levels would have tumbled. If we were to add 10 per cent to the productive capacity of this country for six months, a surplus would be created which would force prices down to the proper level.

More production is the real solution, and the only solution of that particular problem. This solution does not suit the syndicalists, who, through the unrest of our people, plan the overthrow of the Government. It is a solution which labor leaders would oppose with all their power. But there is no other solution except that we wait until European production can get into our markets and force down the cost of living. The vicious circle of increasing prices will never compass a remedy.

There are two methods by which conditions will be brought to proper levels. One is through the starvation which inevitably follows industrial panic; the other is through an increase of production by which plenty for all may be available.

Which shall it be? Organized labor must give the answer.

THE ROAD TO INDUSTRIAL SLAVERY

Much of the disorder for which union labor is held responsible grows out of the belief that a workman is entitled to his job. The adoption of this belief would be the surest road to industrial slavery. If the workman is entitled to his job, whether his service is desired by the employer or not, then the employer must be entitled to service, whether the workman desires to perform it or not. The right of an employer to demand service, except under contract mutually entered into between himself and the workman, would be industrial slavery. The right to serve for a stipulated wage under agreement and the right to quit that employment at the expiration of the contract, are reciprocal to the right of the employer to hire upon agreed terms and

his right to discharge when the term of service has been completed. To refuse these rights to either party is a denial of rights guaranteed by the Constitution. Organized labor, to accomplish the greatest good for its own membership, must base its action upon sound economic principles. The steel strike would not last twenty-four hours except for the world understood fact, justified by the history of all previous strikes, that any effort to operate with any other than those who gave up their jobs would lead to violent disorder, destruction of property and of life. Organized labor cannot hope to include all working men in its ranks nor command entire public confidence until it not only repudiates all lawlessness but strives by every effort within its power to prevent it. Organized labor will never reach its highest efficiency by asking for itself liberties entirely subversive of the rights of others.

The right to quit work and the right to discharge must be reciprocal.

Any other conclusion must lead to conditions subversive of liberty.

GOOD FAITH AND LABOR CONTRACTS

A well-known labor leader closely associated with national affairs in Washington was recently asked whether he would advocate the leaders of organized labor meeting together with the leaders of organized industry to discuss in a very frank and open manner the industrial problems now facing the nation, to fix upon a platform upon which both labor and employers might stand, and to help to carry out by propaganda or otherwise a campaign whereby an exact understanding and agreement might be reached and permanent contracts entered into by which *all* difficulties now pending by threat or suggestion might be eliminated and American industry move upward to the maximum production level.

His answer was terse and final:

"No. Not by any means."

He was asked: "Why?"

His reply was: "Because no matter

what agreement employers might enter into in a conference of this sort, they would at their own pleasure forget and break when they saw fit to do so."

The answer is an interesting one when considered in connection with the national situation as developed during the past few months. In many parts of the United States agreements as to wage scale and other phases of the labor problem have been entered into between organized labor by its leaders and the employers. Some of these have been in written form, some have been verbal agreements, as the result of conferences. Many of these agreements have been broken by the employees even where increased wages have been allowed. It happened in the mines, it happened in street railway transportation, it has happened in many lines of industry, even where the Government has been directly concerned.

Notorious and recent are the Chicago, St. Louis and Boston traction strikes. Later and more important are the two very serious and costly breaks by the unorganized labor in the union shops all through the nation and in every division of railroad work in southern California. Later and still more important is the determination of the United Mine Workers to abrogate the "Washington Agreement" wage contract on November first notwithstanding the fact that it was made to expire upon the Signing of the Peace Treaty with Germany. This is a very serious matter, not alone for the employers of labor but for the labor organizations themselves. Is a contract with a labor organization worth as much as the now proverbial scrap of paper? Has the rank and file of the labor unions reached the mental condition where it believes that it can change its attitude toward agreements according as the wind listeth? Has the employer and the public no right as against the right of the union?

Is it not time that labor called a counsel in its own ranks as to its own ability to control the extent to which its policies may go in violation of its agreements? Is it not time that instead of charging employers with the disposition

to continually break its agreements with labor, it look within itself for the cause which leads the employers of labor to question the sincerity of the whole fabric of unionization?

THE STEEL STRIKE

According to the testimony given before the Senate Committee on Education and Labor by Messrs. Fitzpatrick, Gompers and other labor leaders, the only reason for calling the steel strike was the unionizing of the steel industry and bringing its operation under the dictation and control of the American Federation of Labor. The right to strike, like the right of self-defense, should only be exercised in cases of extreme necessity. The ordering of a strike, and particularly a strike which involves directly the interest of the nation, should only be exercised as a last resort.

Labor leaders insist that the denial of the right to strike means industrial slavery. There is a vast difference between the right of an individual to quit work and the right of an organization to require him to quit work. A strike is a concerted movement made by order of the executive officers of a union to quit work at a certain time and require all of the members of the organization to act in concert. It will be said that strikes will only be declared after a majority vote has authorized a declaration to be made; in other words, after a large number of individuals have conspired together and instructed their superior officers to put their conclusion into effect.

The real purpose of the steel strike is to enforce recognition of the union. The other reasons advanced by organized labor are but flimsy excuses. Its real reason is to secure the right to tax the laborers in the steel industry in order to add to the income and in a general way to strengthen organized labor. The MINING CONGRESS JOURNAL has frequently expressed its belief in organized labor as a means toward the betterment of labor conditions. It does not believe that organized labor has the right to interfere with those who do not voluntarily join the movement. It protests.

with the utmost vigor any plan which undertakes to force men to join the union.

It believes that any plan which undertakes to interfere with the right of any individual to earn a living, whether he belongs to a union or not, is unjust, un-American and in direct violation of the Constitution of the United States. Labor leaders insist upon their constitutional rights of free speech and free assembly. Their alleged denial is one of the reasons advanced to justify the steel strike. Life, liberty and the pursuit of happiness, guaranteed by the Constitution, to them only applies where it benefits those who are members of the union. Those individuals who insist upon preserving their own independence are known to union men as "scabs"; their right to earn a living is denied and their effort in that behalf is frequently prevented by unlawful and often criminal deeds. Organized labor should be, and might be, the most efficient agency for world uplift, but, so long as it justifies lawlessness, or undertakes to interfere with the liberty of any other citizen to enjoy constitutional rights, the good and the bad of the organization will scarcely balance each other in the public mind. Organized labor should give aid in the solution of world problems rather than to take advantage of burdensome conditions to extort from the public further advantages for itself. The high price of necessities of life is at this time bearing with equal burden upon more than 100,000,000 people of this country. These high prices are caused by the shortage of supplies, occasioned by world war waste and intensified by the inefficiency of labor, which now demands shorter hours and greater inefficiency as a means of bettering itself at the expense of the great mass of consumers. There is but one solution to the high cost of living problem—that is to increase production and give the law of supply and demand opportunity to reduce prices to the consumer. The demand of labor for shorter hours and higher wages, and the waste occasioned by strikes called to secure these conditions, necessarily adds to the market value of the short supply of goods now available. To order strikes

during such a period for the sole purpose of enforcing recognition of the union is a crime against the Constitution, a crime against humanity, and a crime which will necessarily react upon those who are responsible for it. The great body of consumers will not always tamely submit to acts, wrong in morals if not in law, which tend to increase burdens already almost unbearable.

AN UNFORTUNATE ILLUSTRATION

The particular effort made by Mr. Samuel Gompers to defend the present attitude of President Wilson upon the labor question as compared with his attitude of ten years ago, when he announced that he was a "fiery advocate of the open shop," is somewhat amusing, and his illustration seems to have been particularly inappropriate. Mr. Gompers stated that it is just as unfair to hold Mr. Wilson to the views expressed years ago as it would be to hold Mr. William Z. Foster to the views which he expressed several years ago.

This colloquy was brought out before the Senate Committee on Education and Labor in its investigation of the steel strike, by questions from Senator Phipps, of Colorado, who read into the record the statements made by Dr. Wilson when president of Princeton University in addresses delivered in 1907 and 1909. Senator Phipps stated that these words were not quoted from Judge Gary, of the steel corporation, but from Dr. Wilson, now President of the United States. In his defense of this change of attitude Mr. Gompers undertook at the same time to explain the supposed change of position of Williams Z. Foster, who is now the secretary of the American Federation of Labor's Committee for organizing the iron and steel workers, who, in a book entitled "Syndicalism," written several years ago, laid down the following platform:

The thieves at present in control of the industry must be stripped of their booty.

The wage system must be abolished.

This social reorganization must be a revolution. Only after such a revolution will the great inequalities of modern society disappear.

Next to the partial strike, the most effective

weapon used by syndicalists in their daily warfare on capitalism is sabotage. Perhaps the most widely practiced form of sabotage, is the restriction by workers of their output. Disgruntled workers all over the world instinctively and continually practice this form of sabotage, which is often referred to as "soldiering." The English labor unions, by establishment of maximum outputs for their members, are widely and successfully practicing it. It is a fruitful source of their strength.

Another kind of sabotage widely practiced by syndicalists is the practice of either ruining or turning out inferior products. Thus, by causing their employers financial losses, they force them to grant their demands.

At this early date, though many minor details of the organization plan of the new society can only be guessed at, many of its larger outlines are fairly clear. One of these is that there will be no state. The syndicalist sees in the state only an instrument of oppression and a bungling administrator of industry, and proposes to exclude it from the future society. He sees no need for any general supervising governmental body and intends that the workers in each industry shall manage affairs of their particular industry; the miners shall manage the mines; the railroads, and so on through all lines of human activity.

Notwithstanding Mr. Gompers' defense it is quite evident that Mr. Foster has not changed his views, but only that he is using a different agency and one carrying greater promise of early success in accord with a plan for the activities of the I. W. W. as set forth in a letter now in possession of the U. S. District Attorney at Chicago. The letter is signed "Yours for revolution, Williams Z. Foster," and in part reads as follows:

I am satisfied from my observation that the only way for the I. W. W. to have the workers adopt and practice the principles of revolutionary unionism—which I take is its mission—is to give up the attempt to create a new labor movement, turn itself into a propaganda league, get into the organized labor movement, and by building up better fighting machines within the old unions than those possessed by our reactionary enemies, revolutionize these unions, even as our French syndicalist fellow-workers have so successfully done with theirs.

Mr. Foster's effort to disrupt the business of the nation, at a time when greater production is the supreme demand, is in full accord with the thought expressed in his syndicalist platform, the certain result of which is to decrease production.

Fortunately, the steel strike, as such, is lost. This is but a skirmish in the great war which syndicalists have pledged

themselves to carry on against established government everywhere.

"The syndicalist" according to this leader of the steel strike, "sees in the state only an instrument of oppression and a bungling administrator of industry." Any body of men which countenances and endorses such action and selects such men to be its leaders has no right to be called conservative.

Samuel Gompers of the American Federation of Labor is on trial before the American public. The steel strike was not justified at any time and, at the present time is, almost if not quite criminal from the standpoint of the necessities of the nation's toilers, to have production so increased that there will be enough to go around.

Mr. Gompers' illustration was most unfortunate.

SENATE DELAYS ACTION ON EMERGENCY TARIFF BILLS

No change has taken place during the last month in the status of the emergency tariff bills which have been passed by the House. Senator Penrose, the chairman of the Senate Committee on Finance, and a majority of his committee disapprove of what is termed piecemeal legislation.

The Ways and Means Committee took up the graphite bill and heard testimony for and against the bill. The producers were represented at the hearing by A. B. Conklin.

FRANCE MUST EXPORT IRON ORE

France is confronted with the necessity of exporting both iron ore and iron and steel. The acquisition of Lorraine has placed her next to the United States in resources both as to iron ore and iron and steel plants. Since France cannot consume her output capacity, it is necessary to establish an export trade. This is difficult on account of labor shortage and high costs and on account of the activity of the United States in foreign fields.

DOMESTIC CONSUMPTION OF GASOLINE SHOWS INCREASE

The increase of home demands for gasoline is shown by the fact that during the first six months of this year our domestic consumption of gasoline was 42,000,000 gallons (or 1,000,000 barrels) more than for the first half of 1918. It is expected with the ever-increasing use and number of automobiles, farm tractors and trucks, the demand for gasoline will continue to increase.—Bureau of Mines' Minerals Investigations.

ANACONDA CLAIM TURNED DOWN BY ATTORNEY GENERAL

The Attorney General of the United States has disapproved the war mineral relief claim submitted by the Anaconda Copper Mining Company. The full text of the opinion, which has an important bearing on other claims is as follows:

"In your letter of August 12 you request an opinion as to whether a claim for losses suffered in the installment and operation of a ferromanganese plant may be allowed under Section 5 of the act of March 2, 1919, entitled 'An Act to provide relief in cases of contract connected with the prosecution of the war, and for other purposes.' You enclose a copy of an opinion by the Solicitor of the Interior Department on the claim of the Anaconda Copper Mining Company for the sum of \$561,346.62 for losses sustained in producing and preparing to produce ferromanganese.

"The pertinent parts of the act of March 2, 1919 (40 Stat. 1272, 1274, 1275) read:

"Sec. 5. That the Secretary of the Interior be, and he hereby is, authorized to adjust, liquidate, and pay such net losses as have been suffered by any person, firm, or corporation, by reason of producing or preparing to produce, either manganese, chrome, pyrites, or tungsten in compliance with the request or demand of the Department of the Interior, the War Industries Board, the War Trade Board, the Shipping Board, or the Emergency Fleet Corporation to supply the urgent needs of the Nation in the prosecution of the war; said minerals being enumerated in the Act of Congress approved October fifth, nineteen hundred and eighteen, entitled 'An Act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of those ores, metals, and minerals which have formerly been largely imported, or of which there is or may be an inadequate supply.

"And provided further, That no claim shall be allowed or paid by said Secretary unless it shall appear to the satisfaction of the said Secretary that the expenditures so made or obligations so incurred by the claimant were made in good faith for or upon property which contained either manganese, chrome, pyrites or tungsten in sufficient quantities to be of commercial importance. And provided further, That no claims shall be paid unless it shall appear to the satisfaction of said Secretary that moneys were invested or obligations were incurred subsequent to April sixth, nineteen hundred and seventeen, and prior to November twelfth, nineteen hundred and eighteen, in a legitimate attempt to produce either manganese, chrome, pyrites, or tungsten for the needs of the Nation for the prosecution of the war, and that no profits of any kind shall be included in the allowance of any of said claims, and that no investment for merely speculative purposes shall be recognized in any manner by said Secretary.

"Provided further, That in determining the net losses of any claimant the Secretary of the Interior shall, among other things, take into consideration and charge to the claimant, the then market value of any ores or minerals on hand belonging to the claimant, and also the salvage or usable value of any machinery or other appliances which may be claimed was purchased to equip said mine for the purpose of complying with the request or demand of the agencies of the Government above mentioned in the manner aforesaid.

"Section 1 of the Act of October 5, 1918 (40 Stat. 1009), made part of the act of March 2, 1919, and more particularly defining the minerals, ores, intermediate metallurgical products, alloys and chemical compounds thereof for which losses in the production or preparation for production are to be paid, reads:

"HON. SECY. OF THE INTERIOR:

"That by reason of the existence of a state of war, it is

essential to the national security and defense, and to the successful prosecution of the war, and for the support and maintenance of the Army and Navy, to provide for an adequate and increased supply, to facilitate the production, and to provide for an equitable, economical, and better distribution of the following named mineral substances and ores, minerals, intermediate metallurgical products, metals, alloys, and chemical compounds thereof, to-wit: Antimony, arsenic, ball clay, bismuth, bromine, cerium, chalk, chromium, cobalt, corundum, emery, fluor spar, ferrosilicon, fullers' earth, graphite, grinding pebbles, iridium, kaolin, magnesite, manganese, mercury, mica, molybdenum, osmium, sodium, platinum, palladium, paper clay, phosphorus, potassium, pyrites, radium, sulphur, thorium, tin, titanium, tungsten, uranium, vanadium, and zirconium, as the President may, from time to time, determine to be necessary for the purposes aforesaid, and as to which there is at the time of such determination, a present or prospective inadequacy of supply. The aforesaid substances mentioned in any such determination are herein-after referred to as necessities."

"The sole question for determination is whether Congress by Section 5 of the Act of March 2, 1919, intended to pay for losses not only incurred in mining manganese but also for losses in manufacturing manganese into an article of commerce known as ferromanganese.

"Manganese is never found in a free state but always in conjunction with some other mineral substance and generally in carbonates and silicates. Ferromanganese is an alloy of iron and manganese containing over 25 per cent manganese and being rich in carbon. It is used in the manufacture of Bessemer steel. Manganese is a product of the mines and ferromanganese is a manufactured article.

"The only uncertainty that could possibly exist as to the meaning of the statute appears to arise out of the word 'produce' which is applicable to both mining and manufacture, and mine owners as well as manufacturers are referred to in the statutes as producers. But there are certain provisions of Section 5 of the act of March 2, 1919, which definitely limit the application of the word to mining operations.

"The claim of the Anaconda Copper Mining Company is evidently based upon the contention that ferromanganese is an intermediate metallurgical product of manganese and is embraced within the provision for payment of losses to producers by reason of the specific mention of intermediate metallurgical products in the act of October 5, 1918, and the adoption of the minerals enumerated in said act in the first paragraph of Section 5 of the act of March 2, 1919. There is, however, no basis for this contention, as the intermediate metallurgical products, metals, alloys and chemical compounds covered by the act are all specifically named in the act of October 5, 1918, and as there is no reference to ferromanganese, the rule of law *expressio unius exclusio alterius* applies.

"The second proviso of the act of March 2, 1919, declares that no claim shall be allowed or paid except upon satisfactory proof that the expenditures were made and the obligations incurred in good faith for or upon property containing the four minerals named in sufficient quantities to be of commercial importance; and the third proviso declares that no claim shall be paid unless there is satisfactory proof that the moneys were invested, or the obligations incurred, after the commencement of the war and prior to the armistice in a legitimate attempt to produce the

said minerals for the needs of the nation and the prosecution of the war, and that the investments were not merely for speculative purposes. The fifth proviso declares that in determining the net losses of any claimant, the then market value of any ores or minerals on hand and the usable value of any machinery or other appliances purchased to equip said mine for the purpose of complying with the request or demand of the agencies of the Government were to be deducted.

"Prior to the war with Germany, manganese was imported into the United States from Europe, Asia, Africa and South America, and a comparatively small quantity was produced in the United States. In order to procure these necessary minerals for the prosecution of the war and to stimulate the production of the four metals in this country, operators were requested by certain agencies of the Government to develop their mines, and Section 5 of the act of March 2, 1919, was passed making provision to indemnify producers who had opened up mines or who had made expenditures looking to the development of mines of commercial importance. This is abundantly shown by the explanations and statements concerning the various provisions of the bill (H. R. 13274, which afterwards became the act of March 2, 1919), on the floor of the House and the conference reports submitted on the bill. There was considerable hostility to Section 5 of the bill, which, in the earlier stages of the proceedings before amendment by the Conference Committee, was known as Section 7, and there was an evident purpose on the part of the managers to indemnify persons who had incurred losses in mining operations as distinguished from manufacturing operations with said minerals.

"Mr. Kahn, one of the members of the Conference Committee on the part of the House, explaining the scope and purpose of the bill, made the following statement on the floor of the House, which is given on the authority of *Binns v. United States* (194 U. S. 495, 496):

"Mr. Kahn: . . . As I said, there are only three minerals involved. They are pyrites, chrome and manganese. They are found in a few sections of the country. We have not been able in recent years to mine these minerals profitably. The people abroad have produced them so much cheaper than they could be produced in this country that the market for these minerals in this country was practically destroyed. But the feeling that actuated the American people was that we must win the war at any cost. To win it we had to have these minerals. We could not get them from the foreign countries that have been hitherto sending them to our shores. Therefore we had to get the men in this country who have the properties on which these mines are located to produce for us the ore that we required. They went to work in good faith for the Government, and they are entitled to relief. I hope that the House will send this bill to further conference and instruct the conferees to include the principle of these provisions of Section 7 in their final report. (65th Cong. Rec., 3d Sess., p. 2879.)

"Further statements were made by Mr. Kahn (*Idem.*, p. 3504), explaining that the bill was intended to reimburse property owners in this country, who at the solicitation of the Government undertook to develop properties containing the minerals specified in the bill in sufficient quantities to be of commercial importnace, for losses sustained in developing mines.

"The portions of the act which have been referred to as limiting payment to losses incurred in the development of mining, were proposed as amendments by the Senate and the discussion of these amendments on the floor of the House shows that they are intended to limit reimbursement to persons who had made *bona fide* investments in the development of properties containing the said ores, and to prevent the extension of the provisions of the bill to losses sustained by manufacturers in working these ores into commercial products (*Idem.*, pp. 4468-4474).

"In the statement of the manager on the part of the House attached to the Conference report on the bill, (H. R. 13274) submitted February 11, 1919, is the following:

"Section 5 provides for the settlement of mining contracts by the Secretary of the Interior. (*Idem.*, p. 3317.)

"Attached to the Conference report on the bill submitted February 26, 1919, is the following statement:

"The Conference adopted the report upon this bill made February 11, with the exception of Section 5 which provided for the settlement of mining contract by the Secretary of the Interior. As to Section 5 of the conferees simply followed the latest instructions of the House authorizing the settlement and liquidation of losses suffered in the production of manganese, chrome, pyrites and tungsten. The conferees respectfully refer to the report and statement filed February 11, 1919, upon this bill. (*Idem.*, pp. 4565.)

"This report was agreed to (*Idem.*, p. 4672).

"The motion to instruct the Managers of the Conference Committee on the part of the House to agree to the Senate amendments which limited reimbursements to losses incurred in developing mines after deducting the value of ores, minerals and machinery for working the mines on hand at the time the armistice was signed, and that only net losses in mining operations without profits should be paid, was offered by Mr. Foster (*Idem.*, p. 4468). This motion was debated at considerable length and substitute motion was offered by Mr. Stafford to instruct the Managers on the part of the House to concur in the Senate amendments except as to Section 7 (afterwards Section 5). The substitute was rejected (*Idem.*, p. 4473) and the motion of Mr. Foster was adopted and the names of the conferees announced (*Idem.*, p. 4474). These were the instructions referred to in the statement attached to the Conference report which was adopted, and which contained the act of March 2, 1919, as finally approved.

"A comparison of the Conference report of February 11, 1919 (*Idem.*, pp. 3316-3317), in February 26, 1919 (*Idem.*, pp. 4563-4565) will show all of the Senate amendments to Section 5 of the Act of March 2, 1919, limiting reimbursement to persons developing or preparing to develop mines of manganese, chrome, pyrites and tungsten in good faith at the request or demand of the five agencies of the Government named in the act.

"My examination of this subject has led me to conclude that producers of ferromanganese do not come within the purview of the act of March 2, 1919, and are, therefore, not entitled to reimbursement for losses incurred in its manufacture."

EUROPE IN DIREST NEED OF 81,000,000 TONS OF U. S. COAL FOR THIS WINTER

With the approach of winter the greatest menace to life in Europe draws on apace. The greatest stress and danger lie in the lack of coal. America has a boundless quantity, but, incredible as it may seem, America cannot supply the needs of Europe. Nor can Great Britain, whose annual production of 287,412,000 tons has shrunk to 214,000,000, Germany's decline being even greater. And while Great Britain's pre-war export of coal ran to 76,689,000 tons, her estimated post-war exports are only 23,000,000 or less.

To avert a world shortage America must export upwards of 81,000,000 tons. The nation's pre-war export of coal was less than 20,000,000 tons. The excess over pre-war exports which must be supplied by this country, if the world shortage is to be made up, is 62,463,000 tons.

This shortage cannot be met. To make up the deficiency America would have to export within the next few months more than four times as much as it ever exported during an entire year. There is not enough tonnage available. With the trebling food exports, even an extra million tons a month would tax shipping beyond its utmost limit. And even that extra million would be of no avail in relieving the distress that threatens Europe.

No phase of world conditions has more closely occupied the United States Shipping Board than this matter of coal for Europe. Keenly alive to it, Mr. J. H. Rosseter, Director of the Division of Operations, had Mr. H. Y. Saint, head of the Export Coal Department of his division, compile the report which is presented here. It portrays the abnormal demand that is being made upon the United States to take care of Europe from a coal standpoint, shows that the demand that is being made upon the Shipping Board for tonnage to be placed in the coal trade is many times greater than can be supplied, and, what is more significant, shows that European nations are doing little or nothing to relieve the situation by using their own tonnage; moreover, that the nations which are doing the least are the ones that are able to do the most.

The outstanding fact, brought out by this analysis, is that European nations are using their own tonnage in trades best suited to their maritime interests and in competition with Shipping Board vessels, leaving Uncle Sam to carry the less profitable coal cargoes for the relief of suffering peoples.

"It would seem," said Mr. Saint in the report to his chief, "cognizance must be taken by the Shipping Board of this situation and something should be done to bring European tonnage into this work of distributing coal to European ports.

"The statistics compiled by this department show that Italy is practically the only European government which is extensively using its own vessels in carrying coal from the United States for Italian relief. In the month of July twenty Italian vessels sailed from American ports with

coal. You will notice that Norwegian, British and Greek ships were plying in the Italian trade, which today is considered a profitable one. At the same time the Shipping Board was having demands made upon it to carry coal to Greece, Switzerland and the Scandinavian countries, as well as to South America.

"Very heavy demands are being made upon the Shipping Board to carry coal to Denmark. Our tabulation shows that no Danish vessels are carrying coal to Denmark, but a number of Danish ships are carrying coal from American ports to South America, which is a profitable trade when the return cargo situation is taken into account.

"It will be noted that Norwegian and Italian vessels are under charter to carry coal to Gibraltar, when the needs in their own countries are great.

"Large demands have been made upon American tonnage to carry coal to the Netherlands, and during July, seventeen American vessels sailed from American ports to that country. During the same period only three Dutch ships carried coal to their home ports while two Swedish and one Norwegian ship were in the Dutch coal trade.

"Insistent requests have been made on the Shipping Board to carry coal to Sweden, and as many as eleven steamships have sailed in one month for that country. Yet Swedish steamships in that trade have not exceeded one a month.

"With the increasing demand upon America to supply coal for Europe and to carry it in American bottoms, and with all the demands predicted upon the increasing distress in various European countries, it would seem that immediate steps must be taken to bring about an effort on the part of the various countries to help themselves in this matter of coal distribution.

"In view of the fact that the Shipping Board cannot meet the demands that are being made upon it, in view also of the fact that our vessels are now being used to relieve distress in Europe where the distress is greatest and relief most urgent, it seems imperative that the European nations which are facing a coal famine should do something to relieve the situation by placing some of their own tonnage in the American coal trade, even though that trade is less profitable than the ones on which these vessels have been placed to compete with the new fleet of the U. S. Shipping Board."

From the analysis made by Mr. Saint it appears certain that the people of France, Belgium, Holland, Italy, Denmark, Norway, Sweden, Spain and Switzerland will be among the ones that must suffer most and that the shortage will fall with no less weight upon Germany, Austria-Hungary, including Czechoslovakia and Jugo-Slovakia. The total coal requirements of the world next winter have

been placed by this authority at 179,511,000 tons, of which 97,723,000 tons can be supplied by countries other than the United States.

This would leave 81,788,000 tons to be furnished by this country, Mr. Saint estimates that there will be furnished 19,325,000 tons, leaving a shortage in the world's coal bin of 62,463,000 tons, a tonnage sufficient to supply the New England States for nearly three years.

Translated into other terms, it would require 1,249,000 cars of 50 tons capacity each, to meet the shortage, or 25,000 trains of fifty cars each. Twelve thousand five hundred vessels of 5,000 tons capacity each would be necessary to carry the cargo across the ocean in one trip. More than 60,000 men would have to dig coal at top speed for a year to produce the tonnage.

During the ten-day period from August 29 to September 9, inclusive, the total allocations of vessels to the coal trade numbered thirty-five.

Most of the coal to be carried in these bottoms goes to European destination, with a large portion going to Italy. One coal-laden ship is destined for Buenos Ayres, one to Chile, one to Rio de Janeiro and three are to carry coal to the Pacific Coast for the American Navy. Of the thirty-five vessels, eighteen have been assigned to sail from Hampton Roads, seven from Philadelphia and ten from Baltimore.

Magnesite Tariff Bill Passes House After Lively Debate

After particularly acrimonious debate the magnesite bill was passed by the House on October 7. The vote was 154 to 112, mainly along party lines.

Smaller Camps Active in Utah

In the smaller camps in Utah conditions are normal, with two exceptions. First, the high price of silver is causing renewed activity in prospects and mines where silver predominates, especially in the Milford District, where several small strikes have been made. Second, in the Big Cottonwood District, Salt Lake County, the Cardiff Mine has discharged its entire crew, due to a demand for higher wages.—Bureau of Mines' Minerals Investigations.

Properties of Austrian Magnesite

The amount of fuel required to sinter Austrian magnesite varies and is dependent in part on the quantity of the ferrous carbonate present. With good, flaming brown coal, having a heating value of 6,000 calories, the quantity required varies from 600 to 800 pounds per ton of sintered magnesite. The fuel requirement has been estimated by others at 1,000 pounds per ton of sintered magnesite produced. The latter coal, however, has a calorific value of only 4,000.

The abundance and accessibility of the brown coal used in sintering Austrian magnesite has been a very important factor in the cheapness of past production.—Bureau of Mines' Minerals Investigations.

COAL PRODUCTION PASSES

11,000,000 MARK SEPTEMBER 20

The high level of production set by the bituminous mines during the first half of the month was maintained and even exceeded in the week ended September 20. The week's output (including lignite and coal made into coke) is estimated at 11,258,000 net tons, an increase over the preceding week of 196,000 tons, or 1.8 per cent. The average production per working day was 1,876,000 tons, more than 71,000 tons higher than during the corresponding period of 1917, though still far short of the record output of a year ago, says the U. S. Geological Survey.

It is interesting to note that the present high level of production, when the rate per day has set a new mark for the year three times in succession, occurs in a season which was distinguished for consistently large output in 1917 and 1918. The past two years have witnessed in the early autumn a period of favorable operating conditions which have made possible the extraction of large tonnages of coal.

For the first time in the present coal year, the week's production of anthracite has equalled that of the corresponding period in 1918. The output for the week ended September 20 is estimated at 1,848,000 net tons, almost exactly the figure reported a year ago. The total output since the beginning of the coal year is naturally far short of that of last year, when an abnormal demand for anthracite was created by the shortage of bituminous.

More consumers seeking to purchase and more miners ready to work rendered more conspicuous the shortage of cars during the week ended September 13. This was in spite of the fact that the railroads provided cars to load the largest tonnage that had been produced in any week this year.

The explanation behind this apparent contradiction is that car shortage is a relative condition. Last April there was no shortage of cars. Today one exists, although the number of cars in commission is greater now than then. Every time another factor curtailing production is eliminated the call for cars becomes stronger. Eliminate the other factors sufficiently and the call for cars will become so strong that a shortage develops. That is just what has been happening since last April. Little by little the other factors have been reduced or eliminated, and a potential demand for cars has been created greater than the railroads can supply.

In the first place the factor of no market has almost completely ceased to operate. Of those mines which can work at all under present market conditions, only a few of the high-cost, poor-quality properties now report losses on account of no market. Considering the country as a whole, the tonnage lost for lack of demand has now sunk to less than 1 per cent of the full-time capacity. Moreover, the reduction went on during the week of September 13. Instead of 2.1 per cent being reported lost on account of no demand, as happened the week before, the losses were only 0.6 per cent. That meant that

1.5 per cent of the country's capacity which had not before needed cars became an active bidder for cars, and in consequence the shortage of cars seemed more apparent.

In the same way the labor factor was reduced in influence. Except for scattering strikes in the New River and Winding Gulf fields, and an increase in losses due to labor shortage reported from Westmoreland, the labor situation improved. In the Southwest especially the influence of extra holidays in curtailing output became less significant. By partial elimination of this factor losses attributed to labor went down from 4.5 per cent to 3.9 per cent, thus setting free 0.6 per cent of the capacity of the country and to the same extent intensifying the demand for cars.

The fact that over the country as a whole complaints of car shortage became more numerous during the week of September 13 is thus largely due to the partial elimination of other factors limiting production. In some districts, particularly Hazard, Northeastern Kentucky, Southern West Virginia High Volatile, the car supply was actually worse. In others it seemed to be worse because a considerable potential tonnage which had hitherto been kept from requisitioning cars now came forward and actively demanded them. Only Somerset, Pocahontas, and the Southern Appalachian fields reported improvement.

With no market and labor troubles reduced to a minimum, transportation disability is the factor which must be overcome if the production of coal is to be still further increased.

Beehive coke shared in the increase reported by bituminous coal and anthracite, the week's production reaching, if not the highest mark this year, at least the highest since the middle of February. The output for the week ended September 20 is estimated at 448,069 net tons, an increase of a half of 1 per cent over that of the week before.

The week of September 20 closed on the Saturday before the beginning of the steel strike. Up to the moment of the strike the production of beehive coke had thus recorded an almost unbroken increase since the depression of last May, an excellent indicator of the revival of business.

A slight increase was reported during the week ended September 14, in the tonnage of bituminous coal dumped at lower Lake Erie ports. Dumpings for the week were 553,379 net tons, or 4.9 per cent less than during the preceding week. Total dumpings since the opening of the season are now 2,000,000 tons, or 10.3 per cent below the performance of last year.

Total bituminous shipments to Atlantic tidewater during August were 3,459,000 tons, or 7 per cent less than during August, last year. The cumulative shipments since January 1 were approximately 4,200,000 tons below those of 1918.

The movement of bituminous coal to New England via tidewater, during the month of August, amounted to 748,934 tons, less than half that of August, 1918.

Total shipments during the first eight months of the calendar year were 4,922,000 tons, as compared with 9,095,000, last year.

ZINC PRODUCTION FOR FIRST HALF OF YEAR GIVEN OUT

Figures compiled by C. E. Siebenthal, of the United States Geological Survey, Department of the Interior, from reports submitted by all zinc smelters which operated during the first six months of 1919 show that the production of zinc from domestic ore in that period was 247,584 short tons, and from foreign ore 7,918 tons, a total production of 255,502 tons, as compared with 260,664 tons in the last half of 1918 and 257,263 tons in the first half.

The stock of zinc held at smelters January 1, 1919, was 41,241 tons, and on June 30 it was 59,651 tons, an increase of 18,410 tons. The stock on June 30, 1918, was 44,502 tons. The stock of zinc held by the War Department on May 29, 1919, was reported as 39,000 tons, 9,000 tons of which were held at producers' plants and the remainder at plants which had been engaged in making munitions. In July the government stocks were reported as 21,000 tons of grade A and 5,000 tons of all other grades. The latest invoice by the War Department, as of August 30, shows 10,821 tons of slab zinc and 66 tons of sheet zinc. The decrease in government stocks was due in part to the purchase of government holdings of their own brands of high-grade spelter by the larger producers.

From the foregoing figures and the records of the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 159,501 tons, as compared with 212,660 tons in the last half of 1918 and 211,870 tons in the first half.

In addition to the zinc produced from ore, 7,328 tons were redistilled from zinc ashes, skimmings, and drosses. Much of this zinc was of grades above prime western, and the total, added to the primary output, gives 262,830 tons consisting of 30,154 tons of grade A, 25,802 tons of grade B, 43,481 tons of grade C, and 163,393 tons of grade D. The output in the last half of 1918 was 63,134 tons of grade A, 29,865 tons of grade B, 56,099 tons of grade C, and 117,899 tons of grade D, showing a decreased production of the higher grades and an increased production of grade D, or prime western metal, for the current period. The decrease in the higher grades was due to the decrease in demand, as a result of the close of the war. Electrolytic zinc amounted to 23,211 tons, as compared with 19,464 tons in the last half of 1918.

Many zinc smelters have been dismantled in the last year and a half, and others are practically abandoned. The total number of retorts at plants at which there were some operations during the first half of 1919 is 158,988 as compared with a maximum total of 224,778 on June 30, 1917. The number of retorts in operation on June 30, 1919, was 82,000 as compared with 123,500 at the end of 1918 and 204,500 at the end of 1916.

RÉSUMÉ OF CUMMINS RAILROAD BILL

S. 2906 introduced by Mr. Cummins and referred to the Committee on Interstate Commerce. The bill repeals the act providing for the operation of transportation systems while under Federal control and for the just compensation of their owners and for other purposes. The repeal will take place immediately upon the passage of the bill.

Section 2 of the bill provides that the indebtedness of any carrier corporation to the United States existing at the time Federal control is relinquished incurred by additions or betterments made during Federal control, and properly chargeable to capital account, shall, at the request of the carrier be extended for a period of five years, with interest at the rate of 5 per cent per annum, payable semiannually, on the first days of January and July of each year and shall be evidenced if possible, by the first mortgage bonds of the carrier, but if this is legally impossible, then in such form as shall be prescribed by the Secretary of the Treasury.

Section 4 of the bill provides that for the purpose of ascertaining the adequacy of rates, fares and charges in producing revenues, the Interstate Commerce Commission shall divide the country into rate districts and the carriers into rate groups, each group of carriers to comprise the railways in one of said districts. The commission shall have the power to hear and determine the issue of the adequacy of the rates for revenue purposes for any one district and the carriers therein as a whole.

In changing or modifying rates of transportation from time to time the commission shall take into consideration the interest of the public, the shippers, the wages of labor, the cost of maintenance and operation, a fair return upon the value of the property, the requirements for additional capital in order to enable the carriers to adequately perform their duties to the public and the conditions under which the same can be secured. For this purpose the commission shall from time to time determine the value of the property in each district and so lower or advance the rates of transportation, as nearly as may be, to provide for a fair return.

Section 7 creates a Railway Transportation Board, which shall be composed of five members to be appointed by the President, by and with the advice and consent of the Senate. The members first appointed shall continue in office as follows: Two for one year, two for two years, and one for three years, respectively. The term of office of each member of this board shall be designated by the President, but their successors shall be appointed for the term of ten years. Any member chosen to fill a vacancy shall be appointed for the unexpired term of the member whom he succeeds. The chairman of the Railway Transportation Board is to be selected by the members of the Board, and shall continue to serve as chairman during his term of office. Each member of the board shall receive a salary of \$12,000 per year.

In addition to the chairman, the board shall elect a secretary, who shall serve during the

pleasure of the board and shall receive compensation to be fixed by the board. The board shall be provided with suitable offices in the city of Washington or elsewhere as may be necessary, and provision is made for the necessary clerical assistance. It is stipulated in the bill that not more than three of the members of the board shall be appointed from the same political party.

Immediately upon organization, the board shall prepare and adopt a plan for the consolidation of the railway properties of the United States, into not less than twenty nor more than thirty-five systems. The board shall make inquiry respecting the transportation needs and facilities of the whole country, and of each transportation situation as it may arise, the adequacy and efficiency of transportation facilities and service, and when and how they should be enlarged or improved. The board shall inquire into the state of the credit of all common carriers. At the expiration of a period of seven years after the passage of the Act, the commission shall proceed to the completion of the plan of consolidation. If in any such proposed system complete consolidation has not occurred, it shall be the duty of the board to secure the incorporation of a railway company under the provisions of the Act whose capitalization in bonds and capital stock shall not be greater than the value of the properties ascertained by the commission under the provisions of the Act of March 1, 1913, with such additions thereto as may be necessary on account of enlargements of the properties to be consolidated.

When the reorganization and consolidation is complete and the existing corporations to be incorporated are in possession and operation of their respective railway systems, the board shall consist of three members only, it being reduced to that number by omitting to appoint successors to the two members whose terms of office first expire after such completion of the plan of reorganization and consolidation.

The Board of Directors of any reincorporated company shall consist of not less than eleven nor more than fifteen persons. There shall at all times be at least two directors selected from the classified employees of the corporation from a list of four classified employees. There shall also be at all times two directors to be appointed by the Railway Transportation Board. Upon all committees of the board of directors upon which power to act in any matter relating to the affairs of the corporation is conferred, there shall be at least one director so selected from the classified employees and one director appointed by the Railway Transportation Board.

The compensation for service upon such board of directors by the persons selected by the employees and the persons appointed by the Railway Transportation Board shall be fixed by the Interstate Commerce Commission and shall be paid by the corporation. The corporation is also to pay the expenses of all members of the board of directors incident to attendance at the meetings of the board of directors or all committees of the board.

The reincorporation of existing railway companies shall be carried into effect regardless of

the laws of any State or Territory that now or hereafter may be inconsistent therewith. Every carrier corporation subject to the Act to Regulate Commerce shall have upon its board of directors at least two directors selected from the classified employees of the corporation and two persons appointed by the Railway Transportation Board.

Section 21 of the Act provides that five or more persons being citizens of the United States, with the recommendation of the board, may incorporate themselves under the Act. The incorporation shall be for a specific and definite purpose, namely, the ownership, maintenance and operation of one of the railway systems into which the railways of the United States are to be divided by the board. The capital stock of such a corporation is to be fixed by the Interstate Commerce Commission, having due regard to the value of the railway property contained in the system which the corporation is organized to own, and with the power to increase the same as additions, betterments, and extensions are added to the system through expenditures properly chargeable to capital account.

The shares of capital stock shall be of the par value of \$100. Certificates therefor shall be issued from time to time at par, fully paid, and only for money or property of equivalent value actually received by the corporation. The corporation shall continue during a period of one hundred years.

The affairs of the corporation shall be managed by a board of not less than eleven nor more than fifteen directors. At least two of the directors shall be selected from the classified employees of the corporation from a list of four. The commission shall prescribe the manner in which the employees shall present and certify the names of those persons who may be nominated by the employees to fill the offices. Two of the directors shall be appointed by the Railway Transportation Board. There shall be at least one director selected from the classified employees and one director appointed by the board, upon all committees of the board of directors upon which power to act in any matter relating to the affairs of the corporation is conferred.

The property of the railway corporations organized or reincorporated under the Act shall not be held to be instrumentalities or agencies of the Government of the United States in the sense that they shall be exempt from taxation by the several states or other lawfully constituted taxing authorities, and all discrimination in the taxation of such property by the states or other lawfully constituted authorities is prohibited.

The share of excess earnings assignable for the benefit of employees shall be put into a fund designated as the employees' welfare fund under the control and administration of the board. The fund may be invested or expended for the following purposes, or any of them:

(a) The promotion of invention and research to ameliorate the conditions of labor and to lessen the hazards of employment.

(b) To extend and improve hospital relief.

(c) To supplement existing systems of insurance and pensions.

(d) To afford opportunities for the technical education of employees.

(e) To establish a system of profit sharing by employees.

In the administration of said fund it shall be the duty of the Board to organize an employee, advisory council to be composed of one representative from each organized craft of railroad employees requesting representation, and no new line of expenditure from such fund shall be undertaken by the board without first receiving the advice of the Council. If the advice is not followed in any respect, the reasons therefor shall be stated in writing and published. Access to the records shall be afforded to the advisory council for the purpose of audit, and full information regarding the expenditures shall be published.

Section 26 of the Act provides for the creation of a Committee of Wage and Working Conditions, composed of eight members, four of whom shall represent labor and four of whom shall represent railroad corporations. The purpose of this committee shall be to settle disputes not adjusted under existing provisions of law or otherwise adjusted between railroads and their employees. The members of this committee shall be appointed for terms of four years, provided that the terms of the first four appointees in each group shall be one, two, three, and four years respectively. Each organized railroad craft may nominate candidates for the memberships representing labor, and the board shall appoint four persons from among such nominees. Each railroad corporation may nominate one candidate for the memberships representing the carriers, and the board shall appoint four persons from among such nominees. If less than four nominations in either group are made, the Board may appoint additional persons believed to represent labor or the carriers. The members of the Committee of Wages and Working Conditions shall receive a salary of \$4,000 per annum. They may appoint a secretary and other necessary employees. The board shall provide a suitable meeting place for the Committee, and shall pay out of its appropriation the salaries of the members and the secretary and other employees employed by such Committee. The board shall also pay all other expenses necessarily incurred in the performance of the duties of the committee.

It shall be duty of the Committee of Wages and Working Conditions to consider all complaints submitted by representatives of employees or of the carriers and to make decisions by majority vote as promptly as practicable. The decisions of the committee shall be certified to the board and shall take effect when approved by the board. If the Committee of Wages and Working Conditions is evenly divided upon any question, the matter in dispute together with all records of proceedings pertaining thereto, shall be referred to the Railway Transportation Board whose decision shall be final. The board shall certify to the commission all decisions of the Committee of Wages and Working Conditions

when approved by the board, and all decisions by the board in cases referred to it promptly upon deciding the same and said certificate shall be conclusive evidence before the commission of the matters so determined and certified.

The wages and salaries paid by carriers, subject to this Act, and the hours of labor, and other conditions of employment shall be fair, just, and reasonable. In determining the fairness, justice and reasonableness of wages and salaries, the committee and the board shall take into consideration the following:

- (a) The scale of wages paid for similar kinds of work in other industries.
- (b) The relation between wages and the cost of living.
- (c) The hazards of the employment.
- (d) The training and skill required.
- (e) The degree of responsibility.
- (f) The character and regularity of the employment.

If two or more persons enter into any combination or agreement with the intent substantially to hinder, restrain or prevent the movement of commodities or persons in Interstate Commerce; or enter into any combination or agreement which substantially hinders, restrains or prevents the movement of commodities, such persons so combining and agreeing shall be deemed guilty of a conspiracy and shall be punished by a fine not exceeding \$500 or by imprisonment not exceeding six months, or both.

The Act provides that from and after the 31st day of December, 1919, the compensation of each of the members of the commission shall be \$12,000 per annum, payable monthly in twelve equal installments.

It shall be the duty of every carrier serving coal mines located upon its line or lines to make just, reasonable and nondiscriminatory distribu-

tion of all cars available for the transportation of coal among such mines on days when the carrier's supply of cars for such service does not equal the requirements of such mines for the transportation of their coal. Every carrier shall make and establish rules and regulations covering the rating of mines and the distribution of cars based upon such ratings. It shall be unlawful for any carrier, by any rule, regulation or practice, either directly or indirectly, to fail or refuse to count against the distributive share of any shipper of coal on any day or days on which there is a car shortage on its line, or any car or cars furnished to or used by such shippers; Provided, That such cars are suitable for or can be or are actually used for the transportation of coal. The rules and regulations of every such carrier shall provide, among other things, that each and every car furnished or used for the transportation of coal on the day or days on which there is a car shortage on its line shall be counted against the distributive share of the shipper receiving such car or cars on the day or days so furnished or used, regardless of who the consignor or consignors, or consignee or consignees of the shipment therein contained may be, or of the purpose for which such commodity may be used or intended, or of the ownership of the car or cars so furnished.

In case of failure or refusal on the part of any carrier to so count any car or cars against the distributive share of the shipper, such carrier, receiver, or trustee, shall be liable to a penalty of not less than \$100 nor more than \$500 for each offense.

The bill provides many amendments to the Act to Regulate Commerce which are too lengthy to go into in the space provided here. Any of our members who are interested in seeing a copy of the bill may receive one upon request.

TWO SOLUTIONS OF THE RAILROAD PROBLEM

(From the New York Tribune)

PLUMB PLAN

Public—To be obtained by issuing Government bonds to pay for legitimate private interests in the industry; courts to define "legitimate interests"; to be bought through a purchasing board comprising members of the Interstate Commerce Commission and one representative each of operators, employees, and Presidential appointees from Board of Directors.

Public—Under direction of board of fifteen directors; five named by the President, five by the operating officials, and five by the classified employees.

Interstate Commerce Commission (last resort); to be automatically reduced to equalize any surplus revenue.

Ownership

Private—Roads to be returned to original owners; organization or reorganization to consolidate all lines into not less than twenty or more than thirty-five systems; consolidation made lawful with approval of Interstate Commerce Commission; capitalization not to exceed value of property.

Operation

Government—Under direction of a Railway Transportation Board of five, appointed by the President with the advice and consent of the Senate.

Rates Fixed By

Interstate Commerce Commission; division of the country into rate districts, with special consideration for each.

Wages Fixed By

Board of Directors.

Commission on Wages and Working Conditions with final appeal to Railway Transportation Board.

Disputes Settled By

Special boards, comprising five representatives each of operating officials and men. Final appeal to Board of Directors.

Commission on Wages and Working Conditions; subject to action by Railway Transportation Board and the Interstate Commerce Commission. Strikes prohibited under penalty.

Financing

Revenue used to pay—

- (1) Operating expenses.
- (2) Fixed charges, including interest.
- (3) Surplus to be divided equally between
 - (A) Government to be used.
 - (a) For improvements and extensions.
 - (b) To retire bond issues.
 - (c) When exceeding 5 per cent of gross revenue to be absorbed by corresponding reduction of rates.
 - (B) Men ("dividend on efficiency")
 - (a) Two-thirds to managerial force.
 - (b) One-third to classified employees.

Financial return to owners limited to "fair" dividends on properties instead of government guaranty of income; revenue excess over "fair" return goes to Railway Transportation Board, one-half whereof goes

- (1) To promote amelioration of labor conditions.
- (2) To extend and improve hospital relief.
- (3) To supplement existing systems of insurance and pensions.
- (4) To give technical education to employees.
- (5) To establish a system of profit-sharing by employees.

Remaining half to go for equipment.

NEW SECRETARY CHOSEN FOR U. S. TARIFF COMMISSION

The vacancy in the Secretaryship of the United States Tariff Commission, caused by the appointment of William M. Steuart as Assistant Director of the Census, will be filled by John F. Bethune.

Mr. Bethune was educated in the Washington public schools and George Washington University. On his graduation he volunteered for service in the Spanish War and made the Santiago de Cuba campaign with the First Regiment of the District Volunteers. After being mustered out he practiced law in this city with Messrs. Blair Lee and George H. Lamar. For a time he served as an assistant in the office of the Official Reporters of the Debates of the United States Senate, and afterwards with the Secretary of the Senate until 1907, when he accepted employment with the Senate Judiciary Committee. In 1908 he was special assistant to the Joint Congressional Committee on the Revision of the Postal Laws. In 1911 he was appointed clerk in the office of Public Buildings and Grounds. He has served as chief clerk of the following organizations since they were first established: The Lincoln Memorial Commission, the Commission on Memorial to Women of the Civil War, the Arlington Memorial Amphitheater Commission, and the Arlington Memorial Bridge Commission. For two years also he has been chief accountant for the Government in the construction of the great buildings in Henry Park for the War and Navy Departments. He has also had direct supervision of all recreational facilities in the public grounds and has developed a system for their operation which has given satisfaction to many thousands of persons.

For some years past Mr. Bethune has made his home in Falls Church, Va., where he is captain of the Colonial Rifles and active in all community affairs, having served for several terms as secretary and president of the Citizens' Association, as well as being a member of the town council.

The Tariff Commission state that their selection of a man for the vacancy in the secretaryship was based entirely upon the comparative merits of the many candidates for the position.

TEXAS PRODUCTION BOOSTS TOTAL OIL OUTPUT FOR YEAR

The recent figures of the United States Geological Survey indicate a greater production of crude oil for June, 1919, than for any month during the last year and a half, credit for which is given to central and north Texas. It is interesting to note that the production for the first six months of 1919, as compared to the first six months of 1918, indicates a greater production for the year 1919 than for 1918. The production for the first six months of 1918 was 172,000,000 barrels, while for the first six months of 1919 it was 177,000,000 barrels, or an increase of 5,000,000 barrels.—Bureau of Mines' Minerals Investigations.

Kerosene Exports Increase

The refinery statistics disclose that 223,000,000 more gallons of kerosene were exported during the first six months of 1919 than in a similar period of 1918. This is probably accounted for by the release of tankers from war duty.—Bureau of Mines' Minerals Investigations.

THE MINING CONGRESS JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS,
Munsey Building, Washington, D. C.

OFFICERS:

Bulkeley Wells, President.
Harry L. Day, First Vice-President.
M. S. Kemmerer, Second Vice-President.
George H. Crosby, Third Vice-President.
J. F. Callbreath, Secretary.
John T. Burns, Western Secretary, Denver, Colo.

DIRECTORS:

M. S. Kemmerer, New York.
Bulkeley Wells, Denver, Colo.
W. J. Richards, Pottsville, Pa.
John C. Howard, Salt Lake City, Utah.
George H. Crosby, Duluth, Minn.
Samuel A. Taylor, Pittsburgh, Pa.
L. A. Friedman, Lovelock, Nev.
Carl Scholz, Chicago, Ill.
Harry L. Day, Wallace, Idaho.
Charles S. Keith, Kansas City, Mo.
Walter Douglas, New York.
E. L. Doheny, Los Angeles, Cal.
E. P. Matthewson, New York.

Paul Wooton, News Editor.

New York Office: Room 225, 30 E. 42d St.,
Tel. Murray Hill 3830.

Chicago Office: 902 Majestic Building, Tel. Central 8744.

Subscription Rate, per year..... \$2.00
Single Copies..... .20

Entered as Second Class Matter January 30, 1915,
at the Postoffice at Washington, D. C.

OCTOBER, 1919

GEO. S. RICE DISCUSSES PHASES OF EUROPEAN MINING SITUATION

Those who either do not visit the mines, or are not mining men, do not understand that undercutting machinery is not so generally applicable under European conditions as it is in the United States, according to Geo. S. Rice. The coal beds there are generally pitching, are faulted and are so deep that—

(a) In a large proportion of the working places these are too irregular and the pitch so great as to make it difficult if not impossible to use undercutting machines effectively or at all.

(b) There is no more labor in picking from the face than there is in breaking the large lumps of the comparatively hard coal in the majority of the mines in the United States, in fact in many cases, machines would be "buried" by the spalling off of coal under the roof pressure.

(c) Generally, the European coal mines use the very commendable system of longwall mining,

which recovers practically all of the coal and fills the excavation with packing, instead of the practice which prevails in the United States of using the room and pillar system, in many places without attempted recovery of pillars. It is estimated that on the average, at least 25 per cent of the coal is lost in the mining in this country. But room and pillar work does permit freer use of undercutting machines and cheap mining.

"I do not mean to say," continued Mr. Rice, "that the equipment cannot be improved, just as it can be improved in most mines in the United States, but it is a mistake to compare the percentage of coal undercut in the United States with that in England or other European countries as a reflection on European methods.

"As regards the alleged cutting of piece rates by the owners whenever the miners tried to see how much they could produce, I very much question this as a general fact; it is not common sense that they would do so.

"The fact that poor seams are worked at all, should be commendable instead of the practice which prevails in the United States, and regretted by mine operators, that on account of competitive conditions, only the best seams are worked, and which frequently sacrifices or leaves thinner or poorer areas of the coal.

"I have observed, in mines in the Middle West, areas with coal of from 4 to 5 feet thick permanently left in a mine because there was 7 to 9 feet of coal elsewhere, and the miners would not take the thinner coal without such an increased rate that the coal could not be produced at a competitive figure.

"The causes of shortage, in my opinion, are as follows in the order of their importance:

"(a) Strikes.

"(b) Letting up of the miners in the amount of work they have been doing in a shift, on the ground that their day has come and they are no longer going to work as hard as they did in the past.

"(c) Voluntary absenteeism as shown by the official statistics.

"(d) Shortening of the hours of labor.

"And on top of this came (July 16) the Sankey award, reducing by one hour, the hours of labor, and which, according to the best mining authorities in Great Britain, is going to make a most serious reduction in the output."

Scale of Payment Changed

Wage increases are apparent in many localities and often coupled with a change in the scale of payment. For instance, in Arizona all classes of underground labor, up to the middle of July, received the same pay, resulting in a tendency of the more skilled men to avoid the more responsible work, and muckers to have no incentive towards greater efforts and promotion to a more responsible job. The new wage scale gives \$5.65 to muckers, \$6.15 to miners, and \$6.40 to timbermen, and should tend to overcome the above tendency.—Bureau of Mines' Minerals Investigations.

POWER SITUATION CALLS FOR REVOLUTIONARY CHANGE

Two of the most important domestic problems facing the United States at the present time concern the supply of power necessary to maintain the industrial activities of the country, and the adequacy of transportation to move the raw materials and finished products involved in these activities. As the coal consumed in the United States engages over a third of the freight capacity of our railroads, and more and more coal is being used, the result is a growing burden upon transportation which must be relieved. The power problem and the transportation problem, therefore, are really different expressions of a single fundamental issue. In this connection the United States National Museum, Smithsonian Institution, has just issued a 50-page bulletin, entitled "Power: Its Significance and Needs," which gives a clear analysis of the whole situation and presents a plan whereby the problems of water power, coal supply and transportation may find an adequate and single solution. This contribution is by Chester G. Gilbert and Joseph E. Pogue, of the Division of Mineral Technology, and is Part 5 of Bulletin 102, the Mineral Industries of the United States, which has already dealt constructively with such matters as coal products, fertilizers, domestic fuel and petroleum.

Quoting from the conclusions of the authors of this Bulletin, it is stated:

"The righting of the power situation requires (1) the establishment of a comprehensive system of electric transmission lines to be administered as a common carrier system like the railways. (2) The provision of such a system will necessitate the coordinated growth of central power stations in coal fields and at water power sites, and in doing so will open to business enterprise a tremendous field of opportunity hitherto closed off from entry, and thus lead to the balanced development of the two major energy resources, coal and water power. (3) The principle of multiple production, recognized and incorporated in national policy, will supplement the additional service gained through the organized employment of the electrical principle; applied to the production of coal-generated electricity, and, through the medium of municipal public utility plants, to the distributive employment of coal, this principle will effectively correlate the recovery of the commodity and energy values, so as ultimately to effect a full saving of the former and an increased gain of the latter, thus permitting a further relative diminution of the amount of fuel calling for transportation in bulky form. The first two points reduce themselves to a single issue, which is purely a business proposition to be handled by a business organization; the third item is more intangible and it is a matter of policy, which, therefore, cannot be delegated or otherwise handled in objective fashion.

"The provision of a common-carrier system of transmission lines, in brief, is the key to the whole problem. Its establishment will remove the retarding influence of high interest rates and antagonistic misunderstanding that has blocked water power development, and will afford the point of departure from precedent in favor of coal-field generation of electricity. Owing to the magnitude of the issue and the manifold lines of progress directly at stake, the development will provide a nuclear point for the establishment of a constructive economic policy, needed not merely for the full development of this field, but as well for the proper unfoldment of the industrial possibilities of the country in general. As such a policy has not developed in the past because of economic sectionalism growing chiefly out of an unequalized development of the energy resources, the nationalization of industrial opportunity attainable through a balanced development of power supply will clear the path of the main obstruction to unified action.

"Thus specific action in respect to establishing a common-carrier system adapted to the power needs of the country will not only go far toward solving the problem of transportation, but it will improve the fuel supply, correct the economic fallacy of drawing upon capital resources while neglectful of income, contribute to the recovery of the values now lost in the consumption of raw coal, lead to an adequate development of electrochemical activities, cut off a needless annual expenditure running well beyond the billion dollar mark and constitute a potent contribution in the direction of stimulating the upgrowth of a constructive economic policy of national scope attuned to the needs of modern industrial development. It is believed that these results would involve national economies, offsetting in large part the cost of the war."

A limited number of these Bulletins are available for free distribution upon application in writing to the United States National Museum, Washington, D. C.

Labor Troubles Affect Markets

The effect of labor disturbances has been notable upon the metal market. Both consumers and producers have been hesitant in planning or deciding upon a definite reconstruction policy. Consumers on the one hand are continually in fear of strikes in their own plants, and in such an event would not wish to have a large amount of raw material tied up in process of manufacture. The producers, or the mining and smelting companies, on their part, naturally do not know to what extent they will be able to fulfil their obligations to the trade and how impending labor unrest will affect them. The threatened railroad strike has also contributed to the difficulty of the situation, as such a strike would profoundly affect both parties and the market.—Bureau of Mines' Minerals Investigations.

**SPURR, LONG IN WASHINGTON,
NEW EDITOR OF THE E. AND M. J.**

J. E. Spurr, a widely known figure in the mining world, has been selected for the editorship of the *Engineering and Mining Journal*. The editor of that and the other mining trade papers are occupying positions of great and increasing importance to the industry and any change in their editors is a matter of very extended interest.

Josian Edward Spurr was born in Gloucester, Massachusetts, October 1, 1870, son of Alfred Sears Spurr, a Gloucester fishing captain, and Oratia Snow Spurr. He came from early Puritan and Pilgrim stock, being descended on his father's side in the eighth generation from John Spurr, Boston, 1638, and on his mother's side from Nicholas Snow, Plymouth, 1623, who married Constance Hopkins, Mayflower, 1620.

Mr. Spurr attended public schools in Gloucester and thereafter decided to study at Harvard University. On graduation in 1893 he accepted summer employment as an assistant in the Minnesota Geological Survey, and during the year, without assistance, made the first geologic map of the Mesabi Range, then newly discovered. The state appropriation being exhausted, he was advised at the end of the season that there were no further funds to continue the salary of \$60 a month which he had been receiving, but he remained in Minnesota without pay in order to complete the presentation of the field work done on the Mesabi Range. By the spring of 1894 he had prepared a bulletin on the subject which the State Geologist accepted and published. In this bulletin he brought out his discovery of the origin of the Mesabi iron ores from a green iron silicate, an origin which had never before been detected for any of the Lake Superior iron ores. This discovery was afterwards confirmed by the work of Messrs. Leith and Van Hise of the U. S. Geological Survey. There has been some question as to whether the original iron silicate is a form of glauconite or a mineral hitherto unknown, but it is agreed that it formed under the conditions that glauconite is known to form under at the present day.

The bulletin on the iron ores attracted the attention of S. F. Emmons of the United States Geological Survey, who engaged Mr. Spurr as assistant. His first work in the summer of 1894 consisted in helping Mr. Emmons in his study at Leadville, Colo., but after a few weeks he was assigned independent work in the study of the Mercur district, Utah, upon which he published a report issued by the Geological Survey. In this report he assigned the origin of the ore deposits to the after-effects of igneous intrusion, this being the first reversion in American geology to this explanation of the origin of ore deposits since the prevalence of the school of thought introduced by Posepny, who conceived of ore deposits as due to the action of hot springs of atmospheric origin. This was a reversion to the explanations advanced earlier in Europe, particularly in France.

In 1895 Mr. Spurr, with G. W. Tower, Jr., as assistant, made a geological survey of the Aspen mining district, in Colorado, with its compli-

cated faulting, and as a result of this survey published Monograph XXXI of the Geological Survey.

Reports concerning gold in the interior of Alaska having reached Washington, Mr. Spurr was selected in 1896 to conduct the first Geological Survey expedition into the interior of Alaska. He selected as assistants Mr. H. B. Goodrich and Mr. F. C. Schrader of the Geological Survey, and the three young geologists made the trip without any further personnel in their party, taking turn about in the cooking and other necessary camp work. The trip was made over the Chilkoot Pass on foot in June, 1896, using Chilkoot Indians for packers, and carrying whip saw and other materials for sawing out lumber and building a boat. The opportunity to purchase a boat which had just been built by a prospector at Lake Lindaman, head of the Yukon, however, saved two weeks, and the party continued on their trip, inspecting practically all of the gold diggings then known, including the Forty-Mile, Sixty-Mile and Birch Creek diggings. It was while the party was at Circle City that gold was discovered on the Klondike, and the miners rushed hither from the Birch Creek and Forty-Mile diggings. The expedition progressed so rapidly that he was able to return to Washington by way of St. Michaels and Seattle before the closing in of winter, and a report was at once published on the geology of the Yukon Gold District.

In 1897 Mr. Spurr went to Berlin as a graduate special student in the university, but became disgruntled with Prussian methods and went to Paris to study under Lacroix. From this most pleasant association he was called back for further Alaskan exploration. In 1898 he took charge of the Geological Survey party which entered from Cook Inlet and ascended the Susitna River to the Alaskan Range. Peterboro canoes were used, and on account of the swiftness and other difficulties of the river the trip was very long and arduous. It is said that this was the only time that this river was traversed by boat from the inlet to the mountains, either before or after this expedition. On this trip Mr. Spurr was accompanied by Mr. W. S. Post, now city engineer of Los Angeles, as topographer of the U. S. Geological Survey; also by Mr. Oscar Rohn, now manager of the Butte Central Copper Company; Mr. Hinkley, now in the lumber business in Maine, and three others. Mr. Hinkley made botanical observations and Mr. Rohn assisted in the surveying. It was intended to take Indians from Cook Inlet but none was willing to undertake the trip.

At that time little was known of the geography of Alaska, the Indians having informed the party that the Susitna River had its source in a swamp, but on getting near the head it was found to rise in the great Alaskan Range. The weary portage of 25 miles or more was made across this range, and the party encountered a torrential stream on the opposite side. Prudence would have suggested a careful progress down this stream, but the loss of provisions due to frequent

upsettings had left the party so short of provisions that no choice was possible. The two canoes remaining out of the original three were embarked in, and 100 miles of extremely torrential waters were run through in one day. These waters later proved to be the main east fork of the Kuskokwim River, and the party traveled 800 miles down the river without further inconvenience except shortage of food. At the mouth of the Kuskokwim they encountered a Moravian Commission to the Eskimo, where they were fed up. Here the party divided, some taking the portage to St. Michaels at the mouth of the Yukon and obtaining a boat to Seattle. The rest of the party, consisting of Messrs. Spurr, Post, Rohn and Hartman, with the one canoe remaining, turned southward and through a series of hitherto unmapped rivers and lakes and cross mountain portages, arriving at the trading post of Nushagak on Bristol Bay. Provisions running entirely out on this trip, the party subsisted for some time on fresh salmon without salt. This trip was in the Eskimo country and the Eskimos were a great assistance. From Nushagak the trip was made across Bristol Bay in Eskimo skin canoes, and leaving practically all baggage the trip was made on foot across the Alaskan peninsula to Katmai opposite the island of Kodiak. In this trip the slumbering volcano of Katmai was passed over, which has since burst out on a stupendous scale. At Katmai, after a considerable wait, they fortunately picked up a steamer which had been looking for the party all along the coast. During this trip of eight months the party had no connection with the outside world. Much of the route had never before been traversed by white men, and aside from the geological and other studies rough maps were made of the general geography. These were the first which had ever been available to geographers over a very large territory. The results of this expedition were published in a report of the Geological Survey entitled "Geology of Southwestern Alaska."

Through his studies of the Yukon gold fields Mr. Spurr arrived at the conclusion that the auriferous quartz veins were the end product of siliceous magmatic differentiation and was the first geologist in any country to discover this vital connection. Veins of barren quartz, however, had long been interpreted by some geologists as connected with pegmatites, but the origin of pegmatites was in great dispute, although one school had long explained them as the last phase of granitic intrusion. In connection with these studies Mr. Spurr pointed out in subsequent papers, before the Institute of Mining Engineers and elsewhere, the worldwide relation of siliceous igneous rocks to gold deposits. He also defined in this connection an important class of rocks more siliceous than granites which he called alaskites. These definitions and conceptions have long been very commonly accepted.

In 1899 Mr. Spurr was commissioned to make a reconnaissance of Nevada and adjacent California in order to fill a gap in the geologic map of the United States and carried out this work.

In addition to completing the geologic map the result of this work was a bulletin entitled "A Reconnaissance of Nevada and Adjacent California south of the Fortieth Parallel."

In 1900 the Turkish Government applied to the State Department in Washington for a geologist and mining engineer, and Mr. Spurr was recommended. He went to Constantinople in the capacity of mining engineer to the Sultan and made several examinations in Asia Minor and Macedonia, including the goldfields of Macedonia which had been worked as early as the time of Philip of Macedon, the father of Alexander the Great. In the course of this expedition his party was almost trapped by a large force of brigands, and a conflict ensued which resulted in the wiping out of one detachment of brigands and the withdrawal of the expedition to the vicinity of a garrisoned town. Mr. Spurr was appointed by the Sultan as a member of a commission to revise the mining laws, the other members being the Minister of Mines and the Grand Vizier. German influence was at that time, however, very strong, and Mr. Spurr came to the conclusion that on account of political conditions the future of Turkey would not be a smooth one. Therefore he returned to the Geological Survey in Washington and undertook to examine the newly discovered camp of Tonopah, Nevada, which he visited repeatedly and on which he wrote several reports and papers. Subsequently, assisted by Sydney H. Ball and George H. Garrey, he made a survey of the geology and ore deposits of the Georgetown quadrangle in Colorado.

In 1906 Mr. Spurr left the government employment to become chief geologist for the American Smelting & Refining Co., American Smelters Securities Company, and allied organizations, and henceforth spent a great deal of time in Mexico as well as other parts of North America in development work at operating properties, as well as mine examinations. He retained his connection with these companies until he left New York in 1912, having the title of consulting engineer during the latter part of his connection. In 1908 the consulting firm of Spurr & Cox, Inc., was organized, with offices in New York, Denver, El Paso and Mexico City, specializing in mine examinations, geological surveys, mine operation, mill construction, and other forms of mining engineering. Besides Mr. W. Rowland Cox and Mr. G. H. Garrey, as partners, the staff included many engineers, such as Godfrey D. Doveton (formerly of the firm of Doveton & Purington of Denver), Carl O. Lindberg, J. H. Farrell, H. DeWitt Smith, John G. Barry, Louis Garbrecht, M. B. Huston, Wilbur H. Grant, Marden W. Hayward, W. D. Blackburn, M. P. Wylie, and others.

In 1912 Mr. Spurr removed to Philadelphia and became vice-president in charge of mining of the Tonopah Mining Company of Nevada, and continued in this capacity until September 1, 1917. During this period, while on a trip to examine gold deposits in the Hudson Bay country in Northern Manitoba, the Mandy copper mine was discovered by an engineer who attached himself to the party. This mine was

opened up under Mr. Spurr's management and proved to be the first producing mine in Manitoba. The ores, which ran 20 per cent copper, together with some gold and silver, were rich enough for transportation in winter over a long and picturesque route to the northern terminus of the railroad facilities at The Pas, from which they were shipped for smelting to Trail, B. C. Several million dollars worth of ore has been produced by this mine to date. In Nicaragua he developed the Eden mine, a gold property which developed into perhaps the most important enterprise in Nicaragua, and in which several million dollars of gold ore, averaging about \$14 per ton, have already been blocked out. Near this he developed the Rosita mine, which had formerly been worked for gold and abandoned, and developed here 1,500,000 tons of copper ore averaging between 5 and 6 per cent copper, and some gold. This mine has not yet been equipped. In the Breckenridge district, Colorado, he consolidated several placer enterprises, including that of the General Development Company, owned by the Lewissohns, into the Tonopah Placers Company, which has had a successful history.

At the outbreak of the war Mr. Spurr went to Washington, and soon after attached himself to the Shipping Board on a dollar a year rating. Here he became associated with Prof. C. K. Leith of the University of Wisconsin on a Committee on Mineral Imports, representing both the Shipping and War Trade Boards and charged with formulating a program for reducing mineral imports in order to save shipping for military service, this being the time of the most acute ship shortage. Later Mr. Pope Yeatman of the War Industries Board became the third member of this committee. On the termination of the work of this committee Mr. Spurr accepted the position of Executive of War Minerals Investigations for the Bureau of Mines, under a special fund of \$150,000 appropriated by Congress, the work of this organization covering all fields of the mining industry where any help could be given which assisted in carrying on the war successfully, and about 100 engineers, including many volunteers, were engaged in various phases of this work. While on the Shipping Board and the Bureau of Mines Mr. Spurr perceived the patriotic necessity of studies as to the control, both political and commercial, of the world's mineral resources. Having mapped out a plan of treatment he secured the voluntary cooperation in this work of many geologists, mining engineers and chemists, who undertook to contribute studies to this series. About thirty studies of this kind were prepared and issued by the Department of the Interior during the war for confidential government use only. The main thesis of this series was the distribution and control of the world's mineral resources through state sovereignty and through commercial control, whether by ownership of mines, control of smelting plants, of transportation, of marketing, or otherwise, with a special bearing on the control by different nationals in countries outside the home countries, and the

political events which had resulted or were likely to result therefrom.

On the termination of the war Mr. Spurr resigned from this activity, and on the passage of the War Mineral Relief Act undertook to organize the force of field investigators, including engineers and auditors, with the title of chief engineer. Having organized this work he accepted the invitation of the Engineering and Mining Journal to become its editor.

In addition to the publications above mentioned Mr. Spurr is the author of numerous papers published in the transactions of different societies and in other publications. In 1902 he published "Geology Applied to Mining," pointing out the applications of geology to the mining engineer and the miner. This book not only had a wide popular circulation but has been used as a text-book in various mining schools in the United States and foreign countries. About 1905 he became convinced of the need for a journal representing mining geology and interested other mining geologists in the plan, with the result that the journal now called Economic Geology was founded, which became the principal journal in the economic field in the world, the subscription list being to a surprising degree world-wide. Shortly after its founding, Economic Geology took over and absorbed the American Geologist, leaving the field of geological journals in America to the Journal of Geology in Chicago, covering the general geological, and Economic Geology covering the applied side of the science.

About 1907 Mr. Spurr announced a theory of ore-deposition which involved the origin by siliceous magmatic differentiation, not only of auriferous quartz veins as he had previously contended, but of most metalliferous veins, and further that veins containing different minerals, such as copper, lead, zinc, gold, etc., were deposited from the same solutions under varying conditions of temperature and pressure. These principles have met with a widespread acceptance.

Petroleum Storage Increase

The storage of domestic crude petroleum in the United States showed a more or less gradual decline during 1918, during which time some 20,000,000 barrels of oil were withdrawn from storage, while since the first of the year the amount of oil in storage has shown a more or less gradual increase of about 8,000,000 barrels, and on June 30, 1919, the total reserve approximated 136,000,000 barrels.—Bureau of Mines' Minerals Investigations.

Feels Competition Keenly

Great Britain is still struggling with the problem of producing iron and steel for local consumption against the competition of the United States, Germany, France and Belgium. The high costs of coal, coke and labor have made this problem very difficult, but conditions appear to be improving, and a fairly steady output of iron and steel has been maintained.—Bureau of Mines' Minerals Investigations.

GOLD AND SILVER OUTPUT FOR 1918 FINAL FIGURES

The Bureau of the Mint and the Geological Survey have issued the following joint statement of the final compilation of the production of gold and silver in the United States during the calendar year 1918:

Compared with the 1917 production—gold \$83,750,700, and silver 71,740,362 ounces—these figures indicate a reduction in gold output of \$15,104,000 and in silver output of 3,930,223 ounces.

State or territory	Gold		Silver	
	Ounces	Value	Ounces	Value ¹
Alaska.....	455,920	\$9,424,700	802,743	\$787,057
Alabama.....	34	700	2	2
Arizona.....	270,078	5,583,000	6,831,465	6,697,978
California.....	811,945	16,784,400	1,432,812	1,404,815
Colorado.....	615,558	12,724,700	6,900,266	6,765,435
Georgia.....	218	4,500	45	44
Idaho.....	33,930	701,400	9,396,009	9,212,411
Illinois.....			8,218	8,057
Maine.....	34	700	6,338	6,214
Maryland.....			164	161
Michigan.....			516,294	506,206
Missouri.....	3	60	42,214	41,389
Montana.....	158,704	3,280,700	16,378,263	16,058,232
Nevada.....	324,134	6,700,440	9,931,969	9,737,898
New Hampshire.....			691	678
New Mexico.....	33,237	687,080	773,662	758,545
North Carolina.....	213	4,400	100	98
Oregon.....	61,228	1,265,700	129,150	126,626
Philippine Islands.....	62,404	1,290,000	13,000	12,746
Porto Rico.....	5	100		
South Dakota.....	324,083	6,699,400	161,232	158,082
Tennessee.....	271	5,600	105,829	103,761
Texas.....	1	20	579,158	567,841
Utah.....	152,526	3,153,000	13,492,555	13,228,911
Vermont.....	48	1,000	4,891	4,795
Virginia.....	19	400	1,814	1,779
Washington.....	16,148	333,800	300,000	294,138
Wyoming.....	43	900	1,255	1,230
Total.....	\$3,320,784	\$68,646,700	\$67,810,139	\$66,485,129

¹ At the average New York dealer's buying price for the calendar year 1918 of \$9.98016.

CLOSING MUNITION PLANTS LOWERS OIL CONSUMPTION

The lubricating oil output for the first six months of 1918 and for a similar period in 1919 is practically the same, amounting to approximately 409,000,000 gallons, but it is surprising to note a decrease of 20,000,000 gallons in the domestic consumption for the first half of this year. The use of lubricating oils may be considered as a key to our industrial activity, and possibly the decrease in demand was due to the closing down of many of the large munition plants, and that during the first half of this year the nation was not entirely converted from a war to a peace basis.—Bureau of Mines' Minerals Investigations.

Fuel Oil Market Easy

Upon signing of the armistice there was a remarkable decrease in the activity on the part of the allied fleets, which has resulted in a markedly less demand for fuel oil. This resulted in a flooding of the fuel oil market, which is today temporarily easy. The refinery statistics show the following figures for the first six months of 1919 as compared to the first six months of 1918: An increase in production from refineries of 107,000,000 gallons; exports decreased by approximately 213,000,000 gallons; domestic consumption increased only 83,000,000 gallons; shipments to insular possessions increased from 2,000,000 to 58,000,000 gallons. The stock of fuel and gas oil at the refineries for June 30, 1919, showed an increase over June 30, 1918, of 261,000,000 gallons.—Bureau of Mines' Minerals Investigations.

FIXED NITROGEN COMMISSION COMPLETES EUROPEAN SURVEY

On June 4, 1919, a commission, known as the "U. S. Fixed Nitrogen Commission," and consisting of Col. J. W. Joyes, Ordnance Department, U. S. A., Chairman; Lieut. Col. A. B. Lamb, C. W. S.; Lieut. Col. F. H. Wagner, Ordnance Department; and Capt. R. S. Tour, Ordnance Department, was sent to Europe for the purpose of obtaining information as to the present state of nitrogen fixation there. The commission visited France, the portion of Germany occupied by the Allies, England, Norway and Sweden, saw a number of representative plants for the fixation of nitrogen by the several methods, and returned to Washington early in September.

The commission had a most interesting and instructive trip, bringing back information as to the development of the processes of fixation, and as to the use of the several marketable products, especially in explosives manufacture and in the fertilizer industry.

Especially interesting from a civil engineering standpoint were the water-power developments of the Norsk-Hydro arc plants at Rjukan, Norway, and of M. Ferdinand Gros in the Pyrenees Mountains in southern France. In the former of these, water from a lake high in the mountains was used successively in two 100,000-K. W. power plants, each with a head of 250 meters, and later in several other plants with lower heads. In the latter, M. Gros has tapped a lake in the Pyrenees fed by perpetual snow, and after successfully overcoming the difficulties of leading this water something over 20 miles through quite rough country, is able to use it with a head of about 800 meters, developing about 30,000 k. w.

M. Gros, a most progressive Frenchman, who has become during the war very noted for his introduction and production of liquid NO_2 for use with benzene in air bombs, expects to use the Pyrenees power above mentioned in a new factory, now nearly completed, where he will make cyanamid for fertilizer use, and also other products.

During the war a number of cyanamid plants were built or commenced in France by private corporations and by the government. Some of these were not finished at the time of the armistice and are not therefore available for production in the future, but there still remains in France a considerable increase due to the war in the capacity for manufacturing cyanamid. Prominent officials of the French government are keenly alive to France's need for a more efficient agricultural system, using much more fertilizer than heretofore. There has been much effort to stimulate the use of fertilizer by pointing out its advantages and by scientific research and demonstration. Arrangements have been made for marketing a considerable quantity of the cyanamid produced by the French government in order that this cheap nitrogen compound made available by the war shall not be lost to agriculture. Although some portion will be converted into the more popular

form of ammonium sulphate, etc., vigorous efforts are being made to use the cyanamid as such on account of the great economy in so doing.

For years Germany has been stimulating by governmental researches, demonstrations and publications, the use of cyanamid as such. These efforts did not cease during the war, but were continued, and it appears that they have had much effect and that the German farmers are using cyanamid for direct application to soil to a considerable extent. Although many of Germany's cyanamid factories, the capacity of which was greatly increased during the war, are now idle for lack of raw materials principally, these factories remain available to produce a great quantity of this cheapest form of fixed nitrogen fertilizer.

There were also considerable increases in the cyanamid producing capacity of Scandinavia during the war, and the plant of the Norsk Hydro company's celebrated Birkeland-Idé arc fixation process was practically doubled in 1915-1916. This plant makes, as its principal normal product, Norway saltpetre, or calcium nitrate, used in Norway especially as a fertilizer for direct application to the soil. It has also been sold during the war to munitions manufacturers. This plant was one of the most interesting seen on the trip as it demonstrates on such a large scale how a process with an extremely low technical efficiency can, under favorable circumstances and with clever engineering, be made to yield a handsome profit. This plant has enormous capital invested in a plant with most advanced hydro-electric and electro-chemical installations in substantial buildings of most handsome and suitable design.

One of the very remarkable attainments of this war was the development, by the German Bodische Aniline und Soda Fabrik, of Professor Haber's synthetic ammonia process in their two plants at Ludwigshaven and Merseburg. This process involves a number of most interesting steps in chemical manufacture. The outline of the process is generally known as the production of a mixture in suitable proportions of nitrogen and hydrogen gases and the continuation of these into ammonia. All chemists know the difficulties involved in the necessity for using a catalyst to stimulate the reaction, which even then must be at high pressure and temperature, and get commercial results, and the necessity for having the gas mixture most carefully purified in order to avoid poisoning the catalyst. The B. A. S. F. plant existing on a small commercial scale at the commencement of the war was greatly expanded under governmental stimulation when the probable inability to bring in enough Chilean nitrate for the war needs became apparent. The plant at Ludwigshaven, which was visited by the commission, was not in operation, but the commission had an opportunity to get a fair general idea of the magnitude of the plant, of the difficulties encountered, and of the apparent success with which they had been met. This plant, as it stands, is said to have a capacity of over 200 tons of ammonia per day and has installations

for using this to make nitric acid, sodium nitrate, and several other products useful in agriculture as fertilizers, and in munitions and other manufactures. The plant is reported to represent an investment of several hundred million marks of the B. A. S. F. capital, and undoubtedly a substantial government subsidy. Notwithstanding the fact that the plant gives the impression of great complexity and therefore of large requirements in skilled and other labor for operation and maintenance, there is no doubt that whatever operating troubles occurred, and there must have been many, the plant did produce the much needed ammonia; and if the statements made as to the writing off during the war of a substantial portion of the value of the plant be true, the plant must be credited with commercial success under the conditions of the war. How this plant and the smaller one at Mersburg will meet the competition of the future, with the accompanying high prices for materials and labor, of course, remains to be seen.

England has done some very serious and valuable scientific research work upon the fixation problem, and if the war had continued would undoubtedly have constructed plants to use some of the several processes.

ASKS FUNDS FOR EXTENDED COAL STATISTICAL COMPILATION

In requesting an appropriation for additional statistical work by the Geological Survey, Secretary Lane wrote:

"I am transmitting herewith a supplemental estimate of appropriation, in the sum of \$40,000, for the collection, by the United States Geological Survey, of additional statistics of coal and coke production, distribution, and consumption, including a special inventory of present stocks of coal and requirements for the winter of 1919-20, with the request that it be submitted to the President of the Senate for consideration in connection with the deficiency bill now pending.

"A similar appropriation was asked by me in January last (House Document 1733, 65th Congress, 3d session) as a provision for the continuation after June 30 of work then being conducted on a much larger scale by the Fuel Administration. As foreseen by me, the need of authoritative statistics frequently collected and promptly issued has continued and the investigation now being conducted by a special committee of the Senate shows the authorization of a special canvas of the country's fuel requirements to be a matter of real exigency. I have therefore been urged by the Chairman of the sub-committee of the Committee on Interstate Commerce to renew the request for this appropriation.

Talc Production Increased

The production of talc in the United States has increased about 90 per cent in the last ten years. During this period the production of ground talc has increased about 115 per cent.—Bureau of Mines' Minerals Investigations.

COAL-TAR BILL PASSES HOUSE; LICENSING FEATURE RETAINED

The House of Representatives on September 26 passed the bill regulating the importation of coal tar products. The bill, as passed, provides for a licensing system. The strong fight made against that feature of the bill was unsuccessful. The important change made by the House in the bill, as introduced, was to substitute the U. S. Tariff Commission as the administering agent instead of the Dye Commission, composed of manufacturers and consumers.

SALINE LAKES TO BE GREATEST SOURCE OF POTASH PRODUCTION

During the next three or four years at least, the production of potash from the saline lakes will continue to be the greatest source of production. The total production of available potash which can confidently be expected during the next two years, if steps are taken to assure a market at a price of at least \$2.00 per unit, is estimated at about 125,000 tons, obtained about as follows:

1. From saline lakes:	Tons
Nebraska.....	55,000
California.....	50,000
2. Organic sources:	
(Waste molasses, beet sugar waste, wood ashes).....	6,000
3. Cement industry.....	8,000
4. From blast furnace industry.....	1,000
5. Special types of silicate rocks and alunite.....	6,000

If certain projects are as successful as anticipated by the interested concerns the production may be considerably higher than the above.—Bureau of Mines' Minerals Investigations.

WILL TRY TO STABILIZE FERTILIZER MATERIALS PRICE

Announcement has been made at the Office of the Secretary of Agriculture that the department, in order to stabilize the prices of raw fertilizer materials as well as the prices for mixed fertilizers, has under consideration not only the question of fair prices for mixed fertilizers for the spring of 1920, but also of such raw materials as sulphate of ammonia, tankage, dried blood, fish scrap, rock phosphate, bulk acid phosphate and cottonseed meal. The manufacturers of cottonseed meal have been invited to a conference in Washington on October 7 at 10 a. m. to consider the cost of manufacture and other facts which will enable the department to arrive at a fair price for this commodity, and the producers of the other raw materials have been invited to present such evidence as they may desire on the cost of production on the 6th day of October at Washington. It is the belief of the department after investigation that there should be a considerable reduction in the prices of all these fertilizer materials. The manufacturers of mixed fertilizers will send in their proposed prices for the spring of 1920 at a later time.

MINERS READY TO HOLD UP PUBLIC FOR \$3,000,000 ANNUALLY SAYS NATIONAL COAL ASSOCIATION

The National Coal Association issued the following statement on September 28:

"The United Mine Workers of America are trying to hold up the people of the United States for a one-billion dollar annual increase in the cost of coal. They have announced their intention of striking November 1 unless their demands are granted, and that is what their demands mean, in dollars and cents. The strike will be called in violation of a contract entered into between the miners and the bituminous operators and approved by the Government, under which the miners and operators both agreed to continue during the period of the war, the wage scales, hours and working conditions agreed upon and still in effect. The operators have maintained this agreement.

Obviously, the country is at war until the Treaty of Peace is ratified and proclaimed. The miners understand this. They did not contend that the agreement was terminated by the signing of the armistice, but continued to work under it. They have now decided to take advantage of the shortage of coal and the imminence of winter to enforce their demands in violation of their agreement.

"The miners demand a six-hour day from the time they enter the mine until they leave it and a five-day week. The present scale calls for an eight-hour day in the working place, and a six-day week. A six-hour day from the time of entering the mine until leaving means approximately five hours in the working places. Thus the demand for shorter hours means an actual reduction from forty-eight hours a week, the present schedule, to about twenty-five hours a week. Working hours would be cut almost in half. This in the face of the fact that we are now short of coal in this country and throughout the world and that increased and uninterrupted coal production is vital.

"On top of this, they demand a 60 per cent increase in wages.

"The effect of these demands, if granted, would be to almost double the present cost of mining coal. In round figures, the increased cost would approximate one billion dollars a year.

"Any such increased cost must necessarily be paid by the public. The prices which bituminous operators have obtained at the mines this year have been materially less than the prices of last year, under government control, and their profits have been reduced to the minimum. For example, exhibits filed by the Pittsburgh operators with the Senate Committee investigating the coal situation show that their profits are less than one-half those of last year and average but 3 per cent on the capital invested. This is typical of the conditions in the industry generally.

"With such a narrow margin of profit it is impossible for the operators to absorb any increase in wages. In fact, the operators have found it necessary to protect themselves by pro-

viding in the contracts for the sale of coal that the contract prices are to be readjusted if there should be any increase in wages, to cover the cost of such increase.

"Therefore, this demand for increased wages, while it is made upon the operators, is necessarily a demand on the public.

"Last year the United Mine Workers requested a revision of the agreement to give them increased wages. Fuel Administrator Garfield refused the request on the ground that it was not justified.

"There are approximately 600,000 men employed in the bituminous mines of the country, of whom about 400,000 are employed in the unionized districts. This comparatively small group of 400,000 men is now attempting to hold up the 110,000,000 inhabitants of the United States for one billion dollars a year. To enforce their demands, in disregard of their contract, they have announced their determination to shut down industrial America and freeze its citizens, if need be."

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of THE MINING CONGRESS JOURNAL, published monthly at Washington, D. C., for October 1, 1919.
City of Washington,
District of Columbia, ss:

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared E. Russell Coombes, who, having been duly sworn according to law, deposes and says that she is the business manager of THE MINING CONGRESS JOURNAL, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations printed on the reverse of this form to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Name of Publisher—The American Mining Congress.
Postoffice address—Washington, D. C.
Officers:
Bulkeley Wells, President, Denver, Colo.
Harry L. Day, First Vice-President, Wallace, Idaho.
M. S. Kemmerer, Second Vice-President, New York City.
George H. Crosby, Third Vice-President, Duluth, Minn.

J. F. Callbreath, Secretary.
Editor—J. F. Callbreath.
News Editor—Paul Wooton.
Business Manager—E. Russell Coombes.
2. That the owners are (give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more or the total amount of stock): The American Mining Congress—a corporation, not for profit. No stockholders.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are (if there are none, so state): None.

E. RUSSELL COOMBES,
Business Manager.

Sworn to and subscribed before me this 25th day of September, 1919.

(Seal.) THOMAS C. WILLIS.
(My commission expires February 20, 1922.)

MINING COSTS IN BITUMINOUS FIELDS OF PENNSYLVANIA ANALYZED

The Federal Trade Commission has made public a report on the cost of producing bituminous coal in Pennsylvania. The period covered ends with December, 1918, but the cost conditions shown for the last quarter of 1918 can be taken as generally representative of those of today. Cost is analyzed into labor, supplies and general expense and selling prices are also given.

shown for the following six significant periods; the year 1916 (before the United States entered the war); January-March, 1917 (when the 1916 wage scale was still in operation); April-August, 1917 (war was begun, a higher wage scale went into effect, and under the influence of a great demand, prices mounted rapidly); September-October, 1917 (immediately following the governmental fixing of maximum prices for coal not sold under contracts made prior to August 21, 1917, and establishment of the Fuel Administration); November, 1917-March, 1918 (follow-

SOUTHWEST FIELD

Period	Costs				Sales realization	Margin
	Labor	Supplies	General expenses	Total f. o. b. mine		
January-March, 1918.....	\$1.36	\$0.27	\$0.32	\$1.95	\$2.72	\$0.77
April-June.....	1.28	.26	.29	1.83	2.49	.66
July-September.....	1.31	.28	.28	1.87	2.43	.56
October-December.....	1.38	.36	.32	2.06	2.40	.34
Year.....	\$1.33	\$0.29	\$0.30	\$1.92	\$2.50	\$0.58
Production for year.....	87,963,186 tons.					

CENTRAL FIELD

Period	Costs				Sales realization	Margin
	Labor	Supplies	General expenses	Total f. o. b. mine		
January-March, 1918.....	\$1.58	\$0.23	\$0.30	\$2.11	\$3.04	\$0.93
April-June.....	1.57	.25	.30	2.12	3.11	.99
July-September.....	1.61	.28	.30	2.19	3.02	.83
October-December.....	1.71	.35	.37	2.43	3.03	.60
Year.....	\$1.62	\$0.27	\$0.32	\$2.21	\$3.05	\$0.84
Production for year.....	63,962,057 tons.					

The report is in great detail. For the year 1918 it covers the operations of 624 operators who mined about 152,000,000 net tons from 1,251 mines, and for the years 1916-1918 it covers the operations of 50 operators who mined about 32,000,000 net tons annually.

All the bituminous mining in Pennsylvania is done in the two fields, the southwest and the central. The foregoing summary table presents the principal facts concerning 1918:

NOTE.—All units are shown per ton of 2,000 pounds.

In this report the margin means the difference between sales realization and the total f. o. b. mine cost. Selling expense, interest and taxes have to be paid from this margin.

For the period 1916-1918 similar figures are

ing adoption of increased wage scale); April-December, 1918 (during this period practically the entire output of coal was subject to the governmental maximum prices, most of the previous contracts having expired March 31, 1918).

The figures in the following tables are averages. The detailed tables in the report show for each field a wide range between the highest and lowest cost producers. The costs of 90 per cent of the tonnage, however, lie within a reasonable cost range.

The effect of governmental regulations and of prices on the production of coal is analyzed at length in the report, and it is found that under regulation, in the face of steadily rising costs in each field, the sales realizations either decreased

or showed only a slight increase over the period of April-August, 1917, immediately preceding regulation.

It is also clear that the coal shortage during the winter of 1917-18 can in no way be attributed to prices fixed by the Government, but was directly caused by lack of adequate transportation. The 50 representative operators whose costs appear in the above table mined less coal from April to October, 1917 (when they obtained their highest margins) than from April to October, 1918 (when their margins were much lower).

What regulation of prices really did was, first, to check abnormal rise in prices, due to frantic bidding by the consumers for a supply insufficient to meet the demand; and second, to establish prices and maintain conditions which, while allowing the operators materially lower margins, yet were ample to secure the increased output which was vitally necessary to win the war.

The commission publishes with its report a chart which is especially interesting. It shows the distribution, at different periods, of each

dollar paid by the purchaser, between the items of labor, supplies, general expense, and margin. It shows that labor received 60 cents out of the dollar in 1916, about 40 cents (35 in the Southwest and 43 in the Central Field) during the period April-August, 1917, just before governmental regulation, and 56 cents during April-December, 1918, when the Fuel Administration's regulations were in full effect. The table shows that labor cost increased 65 per cent (from \$0.82 per ton in 1916 to \$1.35 in 1918) in the Southwest Field, and 88 per cent (from \$0.92 per ton to \$1.73) in the Central Field.

The commission strongly urges the need of the regular gathering and publication of current costs and prices, as being of the greatest value to the public, the coal trade and the coal miner.

The Pennsylvania report of the commission is part of the results of the work of the Commission for the Fuel Administration. Similar data will be published covering anthracite and all the other bituminous fields in the country.

SOUTHWEST FIELD

Period	Costs				Sales realization	Margin
	Labor	Supplies	General expense	Total f. o. b. mine		
Year 1916.....	\$0.82	\$0.12	\$0.25	\$1.19	\$1.36	\$0.17
January-March, 1917.....	.88	.17	.30	1.35	1.99	.64
April-August, 1917.....	1.02	.19	.28	1.49	2.89	1.40
September-October, 1917.....	1.06	.21	.28	1.55	2.79	1.24
November, 1917-March, 1918.....	1.38	.26	.30	1.94	2.76	.82
April-December, 1918.....	1.35	.27	.26	1.88	2.43	.55

CENTRAL FIELD

Year, 1916.....	\$0.92	\$0.10	\$0.30	\$3.32	\$1.40	\$0.08
January-March, 1917.....	1.12	.15	.35	1.62	2.26	.64
April-August, 1917.....	1.30	.26	.36	1.92	3.02	1.10
Sept.-October, 1917.....	1.38	.27	.38	2.03	3.01	.98
November, 1917-March, 1918.....	1.70	.27	.37	2.34	3.27	.93
April-December, 1918.....	1.73	.31	.34	2.38	3.11	.73

Reconstructing Rapidly

Germany seems to have made greater progress toward reestablishing her iron and steel industry than the other European countries, especially considering the great handicap under which she is working. Reports indicate that Germany is to be reckoned with in the world market. A shrewd move on their part seems to be the efforts to have foreign capital become financially connected with German plants, and no doubt at the same time become themselves financially interested in foreign plants, thereby causing intimate relations which will stimulate trade.—Bureau of Mines' Minerals Investigations.

Bleaching Power of Fuller's Earth

The bleaching action of fuller's earth is independent of its chemical composition, but depends entirely upon its selective power of absorption or capillary action. The slight variations in the analysis of the earth bear no relation to its bleaching powers. As is well known, the main use of fuller's earth is for the bleaching of oils, and the gravity method is used in preference to agitation. The main object sought is to get the lightest possible color with the most prolonged use of the earth, the renewal of which is accomplished by burning.—Bureau of Mines' Minerals Investigations.

COST OF LIVING DIRECTLY AFFECTED BY USE OF ENERGY RESOURCES

Our present methods of utilizing the three most important of the country's energy resources—coal, oil, and water power—are extremely wasteful and contribute distinctly and heavily to the present high cost of living. To point out the means of remedying this wastefulness and thus effect a saving to the country of well over a billion dollars a year in the matter of energy supply, is the purpose of a paper just issued by the U. S. National Museum on "The Energy Resources of the United States: A Field for Reconstruction," by C. G. Gilbert and J. E. Pogue, of the Division of Mineral Technology of the Museum.

During the war the aim of the whole country was to speed up industry and produce sufficient materials to win the war. Now that peace conditions again prevail, the problem is one of reconstruction, of building up again the country's normal production, and of making good the enormous waste of a gigantic war of destruction—the hundreds of ships lost to commerce through the horrors of submarine warfare, the thousands of tons of metal shot away on the battlefields of France, all the countless forms of waste incurred in a struggle of great nations. An important step in reconstruction is to eliminate waste in the use of our resources.

On the social side, the manner in which our energy resources are used bears directly upon the problem of wages in relation to the cost of living. The United States has been able to maintain a wage scale higher than other nations only by virtue of the extent to which man-power has been replaced by machine-power in the "dirty work" of industry. It is estimated that the work done annually in the United States by mechanical means, if done by man-power, would require the labor of three billion hard-working slaves. This means that the use of mechanical power gives to each individual in this country the equivalent of thirty servants. The efficient and coordinated utilization of our energy resources provides the means for lowering the cost of production and releasing man-power for more skilled work. Thus by the proper attention to coal, oil and water power, the authors point out, we can keep the wages of labor at a generous level and at the same time reduce the cost of living. This bulletin represents a carefully worked out plan for bettering conditions by attacking fundamental issues and commends itself to the attention of every citizen interested in the national welfare.

The authors consider the three energy resources in turn, pointing out the wastefulness of the present methods of utilization and suggesting corrective measures.

Coal is the basis of organized life—the home, industry and commerce are entirely dependent upon it. Under the present conditions, it is failing to live up to that responsibility. It is wastefully mined because of unnecessary conditions of competition; it is wastefully distributed as a result of unnecessary transportation to regions already supplied with water power or

with coal of a lower grade than that transported; it is wastefully used because the numerous valuable by-products resulting from burning coal are not recovered. The wastes in mining may be decreased by considering coal as a public utility and eliminating undue competition, by integrating the mining operations—organizing them to work together instead of in competition. Unnecessary distribution of coal may be reduced by developing water power in favorable regions, and by improving methods of utilizing the large quantities of lower grade coal in the regions where it occurs, doing away with the necessity of hauling high grade coal to those localities. The waste in utilization of coal may be eliminated by establishing municipal public utility fuel plants to convert coal into gas for heating purposes, at the same time recovering the valuable by-products, ammonia, benzol, and tar. This method of community use of coal will give cheaper fuel, end the smoke nuisance, relieve transportation, and cause the growth of a great coal products industry, whose ultimate possibilities are beyond the grasp of imagination.

Our resources in petroleum, from which gasoline, kerosene, and lubricating oils are derived, have been drawn upon with startling rapidity, the supply having already suffered serious depletion, so that measures to prevent unnecessary waste of this vital material assume an immediate importance. The waste in utilizing this substance is almost unbelievably high, scarcely 10 per cent of the total value being recovered from the petroleum in the crude state. The unmined supply now remaining in the United States is about seventy barrels per person. The waste is due to the lack of adjustment between economic considerations in production and the peculiar geological conditions under which petroleum occurs. The geological reservoirs of oil, though by nature indivisible, are arbitrarily divided into small holdings for the purpose of individualistic production. This situation leads to a series of wastes that consume a great part of the petroleum. A remedy can be applied only by reshaping the methods of production to fit the peculiar occurrence of the raw product, through the development of a new economic policy.

Only a small fraction of the water-power resources of the country is developed. There are two reasons for this: first, the apparent abundance of coal and oil for power purposes, and second the high rate of interest demanded by capital for water-power development and the legal restrictions on water-power rights under Federal control. The full development of the country's water-power possibilities calls for the establishment of a nation-wide system of electric transmission lines to be handled as a common-carrier system like the railways. This will entail the establishment of central power stations in coal fields and at water-power sites.

In concluding, the authors reduce the whole energy situation, an extremely complicated subject, to a fundamental basis in which two courses of action on the part of the Government will bring about the proper development of the whole matter.

1. The provision of a common-carrier system for the transmission of electrical energy, which will lead to a balanced development of coal power and water power, and serve as a coordinating influence in the building up of municipal public-utility fuel plants.

2. The application of a constructive economic policy to the production of petroleum, which will largely correct the wasteful methods which are now leading to a premature exhaustion of the petroleum resource.

A copy of this report, while the edition lasts, may be obtained by addressing the U. S. National Museum, Washington, D. C.

AUSTRIAN MAGNESITE HAD WORLD'S COMMERCIAL SUPREMACY

The facts that the Austrian magnesite deposits are large and are easily quarried, that they are within easy reach of transportation facilities, and the additional fact that labor, at least before the war, was cheap have all tended to give Austrian magnesite commercial supremacy in the world's markets. These conditions, moreover, help to explain the success which Austrian magnesite has achieved in the past and indicate the possibility of the competition which it may be able to exert in the future. Only the massive deposits of the Veitsch type can be quarried and worked at a profit, however, and some of the larger deposits, not well located, have been unable to compete in the past.—Bureau of Mines' Minerals Investigation.

Possible Potash Production Analyzed

It is quite reasonable to expect that with a good market, at a price assured for a period of five years, a production of about 100,000 tons of potash per year may be maintained, for, as the production from the Nebraska Lakes begins to decrease the production from the California saline lakes, and also the cement plants, certain iron blast furnaces, the special types of silicate rocks, and the sugar and molasses wastes will gradually increase to take its place and maintain the total.

At the end of the five-year period it is expected that the California salines, and most plants then equipped for the recovery of potash as a by-product, at cement plants, iron blast furnaces, and from organic waste materials, will be in a position to compete with German potash and produce a minimum of 75,000 tons per year, unless the foreign potash is sold at a lower figure than is now believed to be likely. The above sources, at least, have a reasonable chance to survive and produce potash in competition with foreign potash at between \$1.25 and \$1.50 per unit, assuming that general industrial costs do not increase in that period. The indications are that at a pre-war price, however, there would be very small production, possibly 15,000 to 20,000 tons per year.

To what extent the prospects of obtaining potash from silicates, especially the special silicates, as slate, leucite, and greensand, can hope to compete commercially with foreign potash is yet to be determined, but the indications are that there

is a fair chance for the production of a certain tonnage of potash in direct competition with the German potash, at from \$1.25 to \$1.50 per unit.

There is still so much indefiniteness as to future costs, etc., that any forecasts as to the future are made with a great deal of reservation.

However, a few years of assured market for the output would allow many of these indefinite factors to be settled one way or another, and with a reasonable chance that a number of the above projects may prove successful, *i.e.*, successful within a comparatively short period of time in producing potash at prices comparable to the cost of imported potash.—Bureau of Mines' Minerals Investigations.

Improvements in Arizona

Many companies in Arizona have employment departments which keep careful record of labor employed; besides securing new labor when necessary, these departments have generally authority to review cases of discharged employees with a view to reinstating them where an injustice has been done. Furthermore, working conditions are being improved wherever it is apparent that such can be done. Mine ventilation and the dust problem are receiving attention. Underground shovelling machines are being experimented upon at inspiration with the idea of decreasing labor costs.—Bureau of Mines' Minerals Investigations.

Gasoline Production Increased

In the first six months of 1919 there were produced in the United States 237,000,000 gallons more of gasoline than in the first six months of 1918 and approximately 98,000,000 gallons less were exported. This decrease in export is readily accounted for by the cessation of hostilities.

During the first half of 1919 we exported practically 3,000,000 more gallons of gasoline to our insular possessions than during the same period in 1918, possibly due to the releasing of tankers for domestic trade.—Bureau of Mines' Minerals Investigations.

Activity in Tintic District

In the Tintic District conditions are practically normal. The camp is intensely active due to the many new developments in the eastern part of the district. The high price of silver is a great benefit to the district.—Bureau of Mines' Minerals Investigations.

A. E. Carlton, President of the Crescent Company and the Golden Cycle M. & R. Co. of Cripple Creek, Colo., left on September 24 to attend a conference of representative business men of the United States, France, England and Belgium. Mr. Carlton is a member of the Board of Directors of the United States Chamber of Commerce and is also on the Committee of that organization whose object will be to arrange trade relations between the countries represented.

LEGAL DECISIONS

COURSE OF EMPLOYMENT—EMPLOYEE MINISTERING TO HIS WANTS

The rule is that acts of ministrations by a servant to himself, such as quenching his thirst, relieving his hunger, protecting himself from excessive cold, performance of which while at work are reasonably necessary to his health and comfort, are incidents to his employment and such acts of service are within the Workmen's Compensation Acts, although they only indirectly are conducive to the purposes of the employment. The rule is applied in the case where a watchman employed by a mining company was injured while blasting stumps upon the premises in order to procure fuel for the purpose of heating or cooking. *Ocean Accident & Guaranty Corp. v. Pallaro, Colo., 180 Pacific 95, p. 96.*

CONTRIBUTORY NEGLIGENCE OF EMPLOYEE UNDER WORKMEN'S COMPENSATION ACT

Section 8 of the Colorado Workmen's Compensation Law of 1915 enumerates the conditions which must occur and exist in order to give a right to compensation and freedom from negligence on the part of an employee is not included and therefore negligence is no defense to a claim for compensation. Neither does negligence alone prevent any act ordinarily incident to the employment from being one performed out of and in the course of the employment. A peril that arises from the negligent or reckless manner in which an employee does his work may well be held to be a risk incidental to the employment. *Ocean Accident & Guaranty Corp. v. Pallaro, Colo., 180 Pacific 95, p. 97.*

PERSONS ENTITLED TO MINER'S LIEN—GENERAL MANAGER

The general manager of a mining company stands very much in the position of an owner directing and managing his own business. He is the representative of the corporation and to the laborers under him he is practically the corporation itself. Such managers do not come within the spirit of the mechanics' lien acts and he is not entitled to a lien on the mine or mining property for services rendered, as against bond holders, where, as such general manager, he aided in the issue of the bonds. *International Trust Co. v. Lowe, Colo., 180 Pacific 579, p. 580.*

IRON-MAKING BACTERIA

The United States Geological Survey, custodian of the nation's most prosaic secrets, has made an important discovery. Iron ore is manufactured by bacteria—millions of them work hard for millions of years to make even an ordinary iron mine.

Just what relation these bacteria are to the ones that produce Roquefort cheese, hay fever and beerless beer the Geological Survey does not assume to say. Those are problems that belong to Attorney General Palmer and to the Department of Agriculture. But Prof. E. C. Harder, of the Survey, testifies that he has traced the iron-making bacteria to their lair. He has found them—without union cards—"actively engaged in the deposition of compounds of iron, not only in the surface iron-bearing waters, but in the mine waters to depths of several hundred feet and has made laboratory cultures of various iron-depositing bacteria."

Far more important, however, from the standpoint of household therapeutics, is Prof. Harder's confession that he first learned of their existence through "their ability to clog the pipes of the city water supply systems with thick, hard crusts and slimy, rusty masses composed of millions of individual bacteria." What a blow

MINERS LIENS—NATURE OF WORK

The work for which a lien on a mine or mining property is given by the statute of Colorado is that which is performed in the development and conservation of the mine and the results of which become incorporated with the mine so as to constitute a part of its value. *International Trust Co. v. Lowe, Colo., 180 Pacific 579, p. 580.*

STOCKHOLDER'S LIABILITY—STOCK EXCHANGED FOR MINING PROPERTY

Where mining stock was sold for money and the purchase price was less than the par value of the stock the difference between the par value and the amount actually paid is the measure of the stockholder's liability to the creditor's. But where corporate stock is issued for mining property having no generally defined value, the rule is that where the corporation and stockholders have agreed upon a given value for the property transferred, such valuation is binding and conclusive unless it is fraudulent in purpose or effect. Where the parties place upon the property a valuation in excess of what they knew or believed to be its true value, this is a constructive fraud upon the creditors and the stock will be deemed paid only to the extent of the actual value of the mining property received in exchange for it. *Hasson v. Koebler, Cal., 181 Pacific 387, p. 388. See Herron v. Shaw, 165 Cal. 668, 133 Pacific 488; Harris v. Armour, 169 Cal. 787, 147 Pacific 1166.*

NEGLECT—APPLIANCES MAINTAINED BY THE OPERATOR—PROOF AND PRESUMPTION

Where an appliance or a thing which caused an injury is shown to be under the management of a mine operator, an accident resulting in an injury is such as in the ordinary course of things does not happen if those who have the management of such appliances used proper care, affords reasonable evidence, in the absence of explanation by the mine operator, that the accident arose from a want of care. An injured employee under such circumstances need not do anything further than to show that the defect was known to the operator or that it would have been discovered upon the exercise of reasonable care to ascertain its condition. *Duran v. Yellow Aster Min. & Mill. Co., Cal. App., 181 Pacific 395, p. 396.*

that discovery will be for the predatory plumber! If bacteria cause all the trouble, the remedy certainly ought to be simple enough. All we need to do is to vaccinate the water pipes and thwart the wicked intentions of the bacteria. Doubtless when Prof. Harder has completed his study of his laboratory cultures he will be ready to offer a plumber-harassed world a vigorous antitoxin that will at least discourage the water pipe residents and induce them to confine their attentions to making iron mines. That would be a milestone on the road to the lower cost of living.

Kerosene Stocks Declining

Stocks of kerosene from June 30, 1918, to June 30, 1919, were reduced from 426,000,000 gallons to 252,000,000 gallons, or a reduction of 174,000,000 gallons. The stocks of kerosene have been on a constant decline for the last year and a half, and this in spite of the fact that, in the first six months of 1919, production of kerosene increased 188,000,000 gallons over the same period in 1918. Kerosene is used largely for illuminating purposes, and our greatest market is in the Orient and in South American countries. —Bureau of Mines' Minerals Investigations.

NATIONAL LEGISLATION

September saw little activity in Congress so far as legislation pending for the mining industry is concerned. The League of Nations, labor troubles, etc., have completely engrossed both Houses. A large number of members of both the House and Senate have been away from Washington and practically no action has been taken upon the bills heretofore reviewed in these columns.

The only committee hearing of particular interest to mining is that on the Graphite Bill, which was held before the House Ways and Means Committee on September 26 and 27. Detailed report of this meeting is found in another column of this issue.

The Smoot Leasing Bill, S. 2775, passed the Senate on September 4 and has been referred to the House Public Lands Committee, where it is expected that early action will be taken upon same.

S. 2129, introduced by Mr. Smoot, providing for the payment of certain moneys paid under the public land laws, reviewed in the July issue, passed the Senate August 2 and has been referred to the Public Lands Committee of the House.

H. R. 5215, Tariff on Pyrites, introduced by Mr. Slomp, is still before the Ways and Means Committee of the House.

H. R. 5216, Tariff on Manganese, is still in committee.

H. R. 5218, Tariff on Magnesite, introduced by Mr. Hadley, is before the House of Representatives and is scheduled for an early hearing. The Ways and Means Committee of the House recommended a duty of $\frac{1}{2}$ cent per pound on crude ore, $\frac{3}{4}$ cent per pound on calcine, $\frac{3}{4}$ cent per pound on brick, and 10 per cent ad valorem.

H. R. 6238, Tariff on Zinc, introduced by Mr. McPherson, was reported out of the House Ways and Means Committee with amendments under date of August 1. This bill passed the House September 20.

S. Res. 126, introduced by Mr. Frelinguysen and reviewed in the August issue, providing for the investigation into the causes which have brought about the increase in the market price of coal, is still before the committee.

S. J. Res. 80, introduced by Mr. Kenyon, authorizing the President to call a national labor congress in Washington, was passed by the Senate on August 1, and the House August 2.

H. R. 3184, the Esch Water Power Bill, passed the House July 31, and has been referred to the Water Power Committee of the Senate, where it still remains, no action having been taken thereon.

The following bills of importance to the mining industry have been introduced:

Annual Assessment Work

H. J. Res. 183: Introduced by Mr. Hawley and referred to the Committee on Mines and Mining. The bill provides for an amendment to the bill

to suspend the requirements for annual assessment work and is as follows:

"Resolved by the Senate and House of Representatives of America in Congress assembled,

"That the joint resolution to suspend the requirements of annual assessment work on mining claims during the year 1919, approved August 15, 1919, be, and the same is hereby, amended by striking out the first proviso in said resolution, reading as follows: 'Provided, That no such suspension shall be granted to any one claimant for more than five claims,'"

And the same be, and is hereby, further amended by adding a new section to be known as section 3:

"SEC. 3. That the provisions of said joint resolution are hereby extended to include the Territory of Alaska and to suspend for the year 1919 all laws requiring the performance of annual labor or improvements on mining claims in that Territory."

So that as amended the said joint resolution will read as follows:

"Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the provision of Section 2324 of the Revised Statutes of the United States which requires on each mining claim located, and until a patent has been issued therefor, not less than \$100 worth of labor to be performed or improvements aggregating such amount to be made during each year, be, and the same is hereby, suspended during the calendar year 1919: Provided, That every claimant of any such mining claim in order to obtain the benefits of this resolution shall file or cause to be filed in the office where the location notice or certificate is recorded, on or before December 31, 1919, a notice of his desire to hold said mining claim under this resolution.

"Sec. 2. That this resolution shall not be construed to alter, modify, amend, or repeal the public resolution entitled 'Joint resolution to relieve the owners of mining claims who have been mustered into the military or naval service of the United States as officers or enlisted men from performing assessment work during the term of such service,' approved July 17, 1917.

"Sec. 3. That the provisions of said joint resolution are hereby extended to include the Territory of Alaska and to suspend for the year 1919 all laws requiring the performance of annual labor or improvements on mining claims in that Territory."

Labor

S. 2912, Introduced by Mr. Phelan and referred to the Committee on Appropriations. The bill appropriates \$500,000 to be spent by the Secretary of Labor for the purpose of protecting the land boundaries and coast lines in the interest of the immigration laws.

H. R. 9174, Introduced by Mr. Hudspeth

and referred to the Committee on Immigration and Naturalization. The bill appropriates \$600,000 for the relief of the Immigration Inspector of the Department of Labor and of making an appropriation for the efficient enforcement of all immigration laws. The bill is almost identical with the bill introduced in the Senate by Senator Phelan except that it appropriates \$600,000 instead of \$500,000.

Leasing

S. 2775, the Leasing bill, promoting the mining of coal, phosphate, oil, gas and sodium on the public domain, and known as the General Leasing Bill, passed the Senate on September 4, and has been referred to the House Committee on Public Lands.

This bill carried several important amendments which were finally adopted out of a total of more than fifty which were proposed on the floor of the Senate while the bill was under discussion. One of these provided that, under the Clayton Anti-trust law, oil companies may not charge different prices in various parts of the country for products of the same grade, f. o. b. shipping point. The Secretary of the Interior is given the power to lease coal lands under royalty of not less than 5 cents or more than 20 cents a ton—Alaskan coal lands being excluded. Royalties on oil lands are fixed at $12\frac{1}{2}$ to 25 per cent on production and phosphate 2 per cent of net value of production, and sodium $12\frac{1}{2}$ per cent.

An amendment was tentatively adopted requiring licensees at all times to furnish products to the United States and to the public at reasonable prices.

Miscellaneous

H. Res. 285, Introduced by Mr. Kelly and referred to the Committee on Interstate and Foreign Commerce. The resolution is as follows: "Resolved, That the Secretary of Commerce be directed to furnish to the House a detailed report of the efforts made to stabilize prices in basic industries, through the Peek Committee and the results which would have followed the putting of this plan into effect, based on the prevailing prices of such basic products."

PERSONALS

Nelson Franklin, of Denver, Colorado, is spending several weeks in the East. He is not expected to return to Denver until the middle of October.

Norman Carmichael, General Manager of the Arizona Copper Co., Ltd., at Clifton, was a caller at the offices of the American Mining Congress during his stay in Washington.

George M. Taylor, of the Portland Gold Mining Co., Colorado Springs, spent a few hours in Washington en route to New York on September 10th.

George H. Crosby, Director of the American Mining Congress, Duluth, Minn., was in Wash-

ington during the month for the hearings of the Oneida Mines Co. before the War Minerals Commission. While in the city, Mr. Crosby made the offices of the Mining Congress his headquarters.

A. J. McLennan, Secretary of the Whitmarsh Mining Company, was a Washington visitor in the interest of the claims under the War Minerals Act last month.

Bulkeley Wells, President of the American Mining Congress, was in New York for ten days during the early part of September.

A. B. Conklin, Chairman of the Graphite Section of the Alabama Chapter of the American Mining Congress, has been in Washington during the month looking after the interests of the graphite producers in their bill for a protective tariff now before the Committee on Ways and Means.

Falcon Joslin, of Seattle, made a short visit to the Mining Congress offices during the month.

Carl Scholz has been elected vice-president and general manager of the Raleigh-Wyoming Coal Company, a West Virginia corporation, with headquarters in Charleston.

This company will immediately commence the development of two mines—one in the Beckley Seam on the head waters of the Guyandot River, which will be a shaft mine about 700 feet deep; the other mine will be in the Eagle Seam on the head waters of the Coal River. Both operations will be equipped with modern machinery and are expected to become large producers.

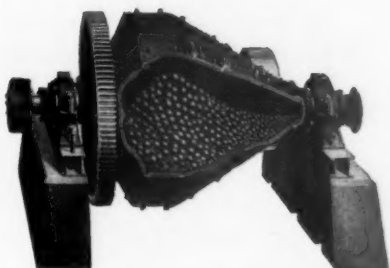
The Hyatt Roller Bearing Co. has established a branch office at 1016 Robson-Prichard Building, Huntington, W. Va., in an endeavor to be of more service to the coal operators in that district.

Mr. H. G. Nash, manager of the Huntington District, will be in charge of this office, and Mr. Nash and his assistants will apply their knowledge of mine car construction to the solution of the haulage problems of the mines in their district.

All mine officials are urged to use the services of this office freely.

WORLD'S LARGEST MAGNESITE DEPOSITS IN AUSTRIA-HUNGARY

Though the term magnesite is generally applied to the iron-bearing carbonate of magnesium, such as is found in Austria and Hungary, by some Austrian magnesite is referred to as bruennerite. The mineral bruennerite has become of commercial importance only in Austria. The important deposits are found in Styria, lower Austria and northern Hungary. It is of interest to know that the world's largest deposit of spathic iron ore, or iron carbonate, occurs at Eisenerz, Styria, while the world's largest deposit of spathic bruennerite is found at Veitsch in the same province.—Bureau of Mines' Minerals Investigations.



WHAT IS IT?

**If you are not familiar with this device you
have not kept pace with grinding progress**

**Hardinge Conical Mill Co.
120 Broadway, New York**

BUYERS' DIRECTORY

INDEX

ACID, SULPHURIC

Irrington Smelting & Refining Works, Irvington, N. J.

AIR COMPRESSORS

Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.

AMALGAMATORS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Mine Equipment & Supply Co., Denver, Colo.

ARMATURES

Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ASSAYERS

Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., Inc., 99 John Street, New York
Lucius Pitkin, Inc., 47 Fulton Street, New York City
Pennsylvania Smelting Co., Pittsburgh, Pa.
Thompson Balance Co., Denver, Colo.

AUTOMATIC CAR CAGERS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

AUTOMATIC (Mine Doors, Truck and Electric Switches)

American Mine Door Co., Canton, Ohio

BALANCES

Ainsworth & Sons, Wm., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.
Thompson Balance Co., Denver, Colo.

BALLS (For Ball Mills)

Harding Conical Mill Co., 120 Broadway, New York City.
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

BALL MILLS

Mine Equipment & Supply Co., Denver, Colo.

BEARINGS (Roller)

Hyatt Roller Bearing Co., Metropolitan Tower, New York City.

BELT FASTENERS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

BELT HOOKS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

BELT LACING (Steel Hinge)

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

BELTING (Conveyor, Elevator, Transmission)

Chicago Belting Co., Chicago, Ill.
H. Channon Co., Chicago, Ill.
Goodrich Co., B. F., Akron, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Avenue, Columbus, Ohio
U. S. Rubber Co., New York City.

BELTING SUPPLIES

Chicago Belting Co., Chicago, Ill.
U. S. Rubber Co., New York City.
Mine & Smelter Supply Co., Denver, Colo.

BIG BLAST HOLE DRILLS

The Sanderson-Cyclone Drill Co., Orrville, Ohio.

BINS (Coke and Coal)

Jeffrey Mfg. Co., Columbus, Ohio

BIT SHARPENERS

Denver Rock Drill Mfg. Co., Denver, Colo.

BLASTING SUPPLIES

Atlas Powder Co., Wilmington, Del.
du Pont Powder Co., The E. I., Wilmington, Del.
Equitable Powder Co., East Alton, Ill.
Hercules Powder Co., Wilmington, Del.

BLOWERS

General Electric Co., Schenectady, N. Y.
Marion Machine, Foundry & Supply Co., Marion, Ind.

BLOWERS (Forced Draft)

Marion Machine, Foundry & Supply Co., Marion, Ind.

BOILERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis. (feed pump)
Mine Equipment & Supply Co., Denver, Colo.

BOILER FRONTS

Marion Machine, Foundry & Supply Co., Marion, Ind.

BOLTS (Expansion)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

BRATTICE CLOTH

H. Channon Co., Chicago, Ill.
Goodwin, Reid & Co., Cincinnati, Ohio
Mikreall Brothers Co., 156 N. La Salle Street, Chicago, Ill.

BREAKERS (Construction and Machinery)

Jeffrey Mfg. Co., Columbus, Ohio
Vulcan Iron Works, Wilkes-Barre, Pa.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.
Wilmot Engineering Co., Hazleton, Pa.

BRIDGES

Stupp Bros. Bridge & Iron Co., St. Louis, Mo.

BRIQUETTING MACH.

General Briquetting Co., 25 Broad Street, New York City
Jeffrey Mfg. Co., Columbus, Ohio

BUCKETS (Clam Shell)

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

BUCKETS (Elevator)

Jeffrey Mfg. Co., Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Stephens-Adamson Mfg. Co., Aurora, Ill.

CABLES (Connectors and Guides)

American Mine Door Co., Canton, Ohio

CABLEWAYS

Jeffrey Mfg. Co., Columbus, Ohio
Macomber & Whyte Rope Co., Kenosha, Wis.

CAGES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Holmes & Bros., Robt., Inc., Danville, Ill.
Mine & Smelter Supply Co., Denver, Colo.

CAGE (Safety Appliances)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Marion Machine, Foundry & Supply Co., Marion, Ind.

CAR DUMPS

Jeffrey Mfg. Co., Columbus, Ohio

Time-Honored and Time-Tested !

FOR nine years, or ever since it was put on the market, the consistently good behavior of the Fort Wayne Electric Rock Drill, under the most severe and trying conditions, has been a matter of enthusiastic comment among mine operators and superintendents.

In most of the larger mines of the country—wherever reliability and rapid advancement of work, together with low drilling cost, are fundamental considerations—there you will find the Fort Wayne doing its bit day in and day out, making money for its owners.

In fact, instances are on record where the Fort Wayne has paid for itself in less than a year's running.

Let us tell you more about the Fort Wayne and its good work--- your request will have our prompt attention.

UNION ELECTRIC COMPANY

Electrical Headquarters
Pittsburgh, Pa.



Hockensmith Wheel and Mine Car Co.

(Pittsburgh District) Penns Station, Pa.

Manufacturers of

**Chilled Annealed
Mine Car Wheels**

Self-Oiling Roller Bearing

Angle Bar Trucks

The Truck for Severe Service

Mine Cars

Steel—Composite—Wood

*Awarded Gold Medal Panama-Pacific
Exposition for Mine Cars, Wheels
and Oiling System*

Catalogue "M" upon request

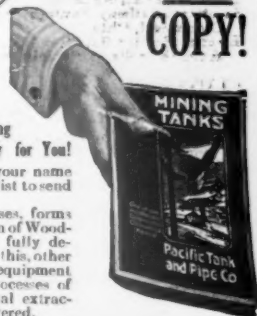
Pacific Tank & Pipe Co.,
San Francisco, Cal.

Gentlemen:
Send me a Copy of your
Mining Tank Catalog
and oblige

Name.....
Title.....
City.....
County.....
State.....

5-1919
AM
CJ

**Here's
Your
COPY!**



A Mining
Catalog Is Ready for You!
All we need is your name
on our mailing-list to send
you a copy.

The many uses, forms
and construction of Wood-
stave Tanks is fully de-
scribed. Beside this, other
cyanide plant equipment
used in late processes of
high-grade metal extrac-
tion is fully covered.

Mail the Coupon



336 MARKET ST.

SAN FRANCISCO, CAL.

CAR AND CAR WHEELS

Hockensmith Mine Car Co., Penn Station, Pa.
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Marion Machine, Foundry & Supply Co., Marion, Ind.
Mine & Smelter Supply Co., Denver, Colo.
United Iron Works Co., Kansas City, Mo.

CASTINGS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
The Lunkenheimer Co., Cincinnati, Ohio
Mine Equipment & Supply Co., Denver, Colo.

CENTRIFUGAL PUMPS

A. H. Simpson Co., 129 Fremont St., San Francisco, Cal.

CHAINS

Frank Prox Co., Terre Haute, Ind.
Jeffrey Mfg. Co., Columbus, Ohio
Morse Chain Co., Ithaca, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.

CHEMICALS

Roeseler & Hasslacher Chemical Co., 100 Wm. St., New York City

CHEMISTS

Beach & Co., Denver, Colo.
Hunt, Robt., & Co., Insurance Exchange, Chicago, Ill.
Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., A. R., Inc., 99 John Street, New York City
E. J. Longyear Co., Minneapolis, Minn.
Lucius Pitkin, Inc., 47 Fulton Street, New York City
Richards, W. J., Denver, Colo.
Western Chemical Co., Denver, Colo.

CLAMPS (Trolley)

Ohio Brass Co., Mansfield, Ohio
Electrical Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

CLUTCHES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Marion Machine, Foundry & Supply Co., Marion, Ind.

COAL COMPANIES

Bertha Coal Co., Pittsburgh, Pa.
Lehigh Coal & Navigation Co., Philadelphia, Pa.
Peabody Coal Co., McCormick Bldg., Chicago, Ill.
Thorne, Neale & Co., Philadelphia, Pa.

COAL CRUSHERS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

COAL CUTTERS

Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, Ohio

COAL HANDLING MACHINERY

Willis E. Holloway & Co., Cleveland, Ohio
Jeffrey Mfg. Co., Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

COAL MINING MACHINERY

Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.

COAL WASHING MACHINERY

Jeffrey Mfg. Co., Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

COCKS (Locomotive, Cylinder and Gauge)

The Lunkenheimer Co., Cincinnati, Ohio
Nicholson, W. H., & Co., Wilkes-Barre, Pa.
Ohio Brass Co., Mansfield, Ohio

COILS (Choke)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

COMPANY STORES (Coupons)

Allison Coupon Co., Indianapolis, Ind.

COMPRESSORS, AIR

General Electric Co., Schenectady, N. Y.
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.

CONCENTRATORS (Magnetic)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

CONCENTRATORS (Table)

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

CONCRETE MIXERS

Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.

CONDENSERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

CONTROLLERS

General Electric Co., Schenectady, N. Y.
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

CONVEYORS, BELT

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.
U. S. Rubber Co., New York City.

CONVEYORS, CHAIN FLIGHT

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Wilnot Engineering Co., Hazleton, Pa.
Stephens-Adamson Mfg. Co., Aurora, Ill.

CONVEYORS, COAL

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

CONVEYORS AND ELEVATORS

Willis E. Holloway & Co., Cleveland, Ohio
Jeffrey Mfg. Co., Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

CONVEYOR MAGNETS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

CONVEYORS, PAN OR APRON

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

CONVEYORS, SCREW

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

CORE DRILLING

H. R. Ameling Prospecting Co., St. Louis, Mo.
Hoffman Brothers, Punxsutawney, Pa.
E. J. Longyear Co., Minneapolis, Minn.

COUPLINGS

Nicholson, W. H., & Co., Wilkes-Barre, Pa.

COUPONS

Allison Coupon Co., Indianapolis, Ind.

CRANES

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

STRUCTURAL STEEL

We have built buildings for mine plants complete from Head Frame to Flotation

STUPP BROS.
Bridge & Iron Co.
Frisco Bldg.
St. Louis, Mo.

We have built every kind of building used in smelter plants from Roaster to Cottrell

WHAT CAN WE BUILD for YOU?



O-B Mansfield Clamp

Patent Applied for

**IT PAYS TO INSTALL
O-B MANSFIELD CLAMPS**

Force applied on nut is multiplied by leverage on the jaws.

Strength greater than emergency demands.

O-B Sherardizing protects every part, including threads from corrosion.

The Ohio Brass Company

MANSFIELD

OHIO



Protect your lamps from breakage or unauthorized removal by using

Flexco-Lok

Expanded Steel Lamp Guards

Flexco-Lok Lamp Guards effectively protect the lamp against any sudden shock to which it may be subjected.

Flexco-Lok is very simple in construction and is easily adjusted. It is LOCKED with a key which prevents theft.

A single broken or stolen lamp costs more than a guard. Install Flexco-Lok Lamp Guards now.

FLEXIBLE STEEL LACING CO.

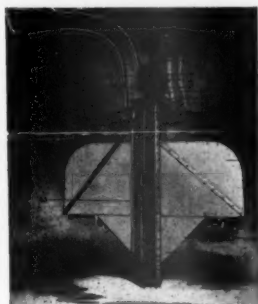
Manufacturers of

"ALLIGATOR" STEEL BELT LACING

Dept. L. G. 25

522 S. Clinton St.

CHICAGO, ILL.



**The Connellsville Manufacturing and
Mine Supply Company**

Connellsville, Pa.

If you need any cost reducing mine equipment, write us.

The Cage, Hoist and Fan Builders

CRANES

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CROSS-OVER DUMPS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CRUSHERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.
Marion Machine, Foundry & Supply Co., Marion, Ind.
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.
Stephens-Adamson Mfg. Co., Aurora, Ill.
United Iron Works Co., Kansas City, Mo.

CRUSHERS, COAL

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
United Iron Works Co., Kansas City, Mo.

CRUSHER (Proctors)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

CRUSHING, PLANTS, COKE

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CUTTER HEADS

Frank Prox Co., Terre Haute, Ind.

DERRICKS AND DERRICK FITTINGS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

DESIGNERS OF PLANTS

Willis E. Holloway & Co., Cleveland, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Mine Equipment & Supply Co., Denver, Colo.

DIAMOND CORE DRILL CONTRACTING

Hoffman Bros., Punxsutawney, Pa.
Longyear Co., E. J., Minneapolis, Minn.

DOORS, AUTOMATIC MINE

American Mine Door Co., Canton, Ohio

DRAG LINES

Denver Rock Drill Co., Denver, Colo.
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

DRIFTERS, DRILL

Denver Rock Drill Mfg. Co., Denver, Colo.

DRILLS (Blast Hole)

Denver Rock Drill Mfg. Co., Denver, Colo.
The Sanderson-Cyclone Drill Co., Orrville, Ohio

DRILLS, CORE

Hoffman Brothers, Punxsutawney, Pa.
Longyear Co., E. J., Minneapolis, Minn.

DRILLS, ELECTRIC

General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Union Electric Co., Pittsburgh, Pa.

DRILLS, HAMMER

Denver Rock Drill Mfg. Co., Denver, Colo.

DRILLS (Hand Operated Coal)

Ohio Brass Co., Mansfield, Ohio

DRILLS (Hollow Rod)

The Sanderson-Cyclone Drill Co., Orrville, Ohio

DRILLS, PNEUMATIC

Denver Rock Drill Mfg. Co., Denver, Colo.

DRILLS. PROSPECTING

Hoffman Brothers, Punxsutawney, Pa.
Longyear Co., E. J., Minneapolis, Minn.
The Sanderson-Cyclone Drill Co., Orrville, Ohio

DRILLS, ROCK

Denver Rock Drill Mfg. Co., Denver, Colo.
General Electric Co., Schenectady, N. Y.
Pneumelectric Machine Co., Syracuse, N. Y.
The Sanderson-Cyclone Drill Co., Orrville, Ohio
Union Electric Co., Pittsburgh, Pa.

DRILL STEEL SHARPENERS

Denver Rock Drill Mfg. Co., Denver, Colo.

DRUMS (Hoisting, Haulage)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Marion Machine, Foundry & Supply Co., Marion, Ind.

DRUMS (Magnetic)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

DUMPS, CROSS-OVER

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

DUMP CARS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Marion Machine, Foundry & Supply Co., Marion, Ind.

DYNAMOS

Goodman Mfg. Co., Forty-eighth Place and Halstead Street, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ELECTRICAL APPARATUS

General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ELECTRIC HOISTING MACHINERY

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

ELECTRIC LAMP GUARDS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

ELECTRIC LOCOMOTIVES

Goodman Mfg. Co., Forty-eighth Place and Halstead Street, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Ohio Brass Co., Mansfield, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ELECTRIC MINE SUPPLIES

Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio.

ELECTRICAL SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Mine & Smelter Supply Co., Denver, Colo.
Union Electric Co., Pittsburgh, Pa.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ELECTRO MAGNETIC SEPARATORS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

ELEVATORS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ELEVATORS, BUCKET

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

ELEVATOR MACHINERY

Jeffrey Mfg. Co., 953 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

ELIMINATORS

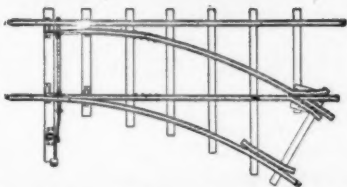
Nicholson, W. H. & Co., Wilkes-Barre, Pa.

THE CENTRAL FROG & SWITCH CO.

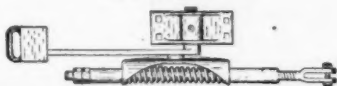
CINCINNATI, OHIO

Manufacturers

FROGS-SWITCHES



Crossovers, Crossings, Stands,
Portable Track, Rail Braces
and Track Material of every
description



Prompt Shipment

Write Us

Lamps

We make complete line
of carbon lamps of all
standard candle - power
and voltage.

Especially adapted for
mine service.

Prompt deliveries guar-
anteed.

Write for prices

THE SUNLIGHT ELECTRICAL
MANUFACTURING CO.

WARREN, OHIO



Are You Getting
This Every Month?

Ask Us To Put You
On Our List

HAND-FIRED STOKER SOOT BLOWERS SHAKING GRATES DRAFT BLOWERS BOILER FRONTS

Send for Catalog

Coal Crushers	Shaking Screens
Tipplers	Feeders
Larries	Sheaves
Mine Cages	Conveyors
Gravity Screens	Elevators, Etc.

Send for Bulletin

MARION MACHINE, FOUNDRY AND
SUPPLY COMPANY

P. O. BOX 800 MARION, INDIANA
SCOTSDALE, PENNA.

ENGINES, GAS AND GASOLINE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Mine Equipment & Supply Co., Denver, Colo.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The
1631 Liberty Avenue, Pittsburgh, Pa.

ENGINES (Hoisting and Hauling)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The
1631 Liberty Avenue, Pittsburgh, Pa.

ENGINES, OIL

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Mine Equipment & Supply Co., Denver, Colo.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The
1631 Liberty Ave., Pittsburgh, Pa.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ENGINES, STEAM

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Standard Scale & Supply Co., The
1631 Liberty Avenue, Pittsburgh, Pa.

ENGINEERS

H. R. Ameling Prospecting Co., St. Louis, Mo.
Hunt, Robt. & Co., Insurance Exchange, Chicago, Ill.
Indiana Laboratories Co., Hammond, Ind.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Longyear, E. J. & Co., Minneapolis, Minn.
Sanderson-Cyclone Drill Co., Orrville, Ohio

EXPANDED STEEL LAMP GUARDS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

EXPLOSIVES

Atlas Powder Co., Wilmington, Del.
Du Pont Powder Co., Wilmington, Del.
Equitable Powder Co., East Alton, Ill.
Hercules Powder Co., Wilmington, Del.

FANS, VENTILATING

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Vulcan Iron Works, Wilkes-Barre, Pa.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

FEEDERS, ORE

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Mine & Smelter Supply Co., Denver, Colo.
Stephens-Adamson Mfg. Co., Aurora, Ill.

FILTERS (Water)

Wm. B. Scaife & Sons Co., Oakmont, Pa.

FITTINGS (Ground)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

FORGINGS

Mine Equipment & Supply Co., Denver, Colo.

FORGED STEEL BALLS

Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

FRAMES (Head Frames for Mines)

Stupp Bros. Bridge & Iron Co., St. Louis, Mo.

FROGS AND SWITCHES

Central Frog & Switch Co., Cincinnati, Ohio.

FURNACES, MECHANICAL ROASTING

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

GEARS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

GENERATORS AND GENERATING SETS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

GONGS (Pneumatic Signal)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

GRATES (Shaking)

Marion Machine, Foundry & Supply Co., Marion, Ind.

GRATES (Stationary)

Marion Machine, Foundry & Supply Co., Marion, Ind.

GREASES

Ohio Grease Co., Loudenville, Ohio.

GRINDING BALLS

Mine Equipment & Supply Co., Denver, Colo.

GUIDES

Frank Prox Co., Terre Haute, Ind.

GUARDS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

HANGERS (Insulated Trolley)

Electric Service Supplies Co., 7th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio

HAULING ROPES

Hazard Mfg. Co., Wilkes-Barre, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.

HAULAGE SUPPLIES (Electric)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

HEADLIGHTS, ARC AND INCANDESCENT

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio

HIGH INTENSITY MAGNETS

Dings Magnetic Separator Co., 109 Smith Street, Milwaukee, Wis.

HITCHINGS

Macomber & Whyte Rope Co., Kenosha, Wis.

HOISTS, ELECTRIC

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Pneumoelectric Machine Co., Syracuse, N. Y.
Vulcan Iron Works, Wilkes-Barre, Pa.

HOISTS, PORTABLE

Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The
1631 Liberty Avenue, Pittsburgh, Pa.
Stephens-Adamson Mfg. Co., Aurora, Ill.

HOISTS, STEAM

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Holmes, Robt., & Bros., Inc., Danville, Ill.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The
1631 Liberty Avenue, Pittsburgh, Pa.
United Iron Works Co., Kansas City, Mo.
Vulcan Iron Works, Wilkes-Barre, Pa.

ASBESTOS PRODUCTS

Pipe Coverings

Vulcanized Fibre, Sheets, Tubes and Rods

Mica Insulations

BRATTICE CLOTHS: Jutex—Non-Inflammable. Pylox—Waterproof and Non-Inflammable Jute. Dutex—Duck, Non-Inflammable and Waterproof. Bratex—Duck, Non-Inflammable. Black Jack Waterproof.

OLD SAIL CLOTH

MIKESELL BROTHERS CO.

156-178 North LaSalle St., CHICAGO



THE BIG EXPENSE
STARTS AFTER YOU
HAVE INSTALLED
A MANUALLY OP-
ERATED CIRCUIT
BREAKER

Eliminate that expense
by installing
**Automatic
Reclosing
Circuit
Breakers**

Unlike other circuit breakers the Automatic Reclosing Circuit Breaker requires no attendant to help it perform its functions.

These full Automatic Reclosing Circuit Breakers have proven very satisfactory with thousands of users for the past seven years. Why not enjoy the savings others are?

**THE AUTOMATIC RECLOSING CIRCUIT
BREAKER COMPANY**

COLUMBUS, OHIO

U. S. A.

Coupon Books for Mine Commissaries



The best method of handling sales.
They save time and money—Stop
leaks—Prevent errors—In use for
a quarter century.

*For Prices, Samples and
Catalogues, Write*

Allison Coupon Company
Indianapolis Indiana, U. S. A.

EGYPTIAN TIMBER COMPANY RAILROAD CROSS-TIES

AND EVERYTHING IN THE WAY OF
TIMBER FOR MINES

821 Railroad Exchange Building

St. Louis, Mo.

HOISTING ROPES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Hazard Mfg. Co., Wilkes-Barre, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.

HOISTS (Room & Gathering)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

HOSE, AIR

Goodrich Co., The B. F., Akron, Ohio
United States Rubber Co., New York City.

HOSE (Rubber)

Goodrich Co., The B. F., Akron, Ohio
United States Rubber Co., New York City

INSTRUMENTS, SURVEYING

Almsworth & Sons, Wm., Denver, Colo.

INSULATING MATERIAL, ELECTRIC

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

INSULATING TAPE AND CLOTH

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

INSULATORS, FEEDER WIRE

Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

INSULATORS, SECTION

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

INSULATORS (Porcelain)

Ohio Brass Co., Mansfield, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

INSULATORS (Third Rail)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio

INSULATORS (Trolley)

Ohio Brass Co., Mansfield, Ohio

INSULATED WIRE and CABLE

Hazard Mfg. Co., Wilkes-Barre, Pa.
American Steel & Wire Co., Chicago, Ill.
Reehling Sons, John A., Trenton, N. J.

IRON AND STEEL

Stupp Bros. Bridge & Iron Co. St. Louis, Mo.

JACKS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

JIGS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

LAMPS, ARC AND INCANDESCENT

General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

LAMPS, (Carbon)

The Sunlight Electrical Mfg. Co., Warren, Ohio

LAMPS ELECTRIC

General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

LAMP GUARDS (Key Locking)

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

LAMP PROTECTORS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

LARRIES

Marion Machine, Foundry & Supply Co., Marion, Ind.

LEATHER BELTING

Chicago Belting Co., Chicago, Ill.

LEATHER (Valves, Packings, Specialties)

Chicago Belting Co., Chicago, Ill.

LIGHTNING ARRESTERS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

LINING FOR BALL MILLS

Hardinge Conical Mill Co., 120 Broadway, New York City.

LOADING BOOMS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Marion Machine Foundry & Supply Co., Marion, Ind.

LOADING MACHINES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

LOCOMOTIVES, ELECTRIC

General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

LOCOMOTIVES, GASOLINE

Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Mine Equipment & Supply Co., Denver, Colo.
Vulcan Iron Works, Wilkes-Barre, Pa.

LOCOMOTIVES, RACK RAIL

Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

LOCOMOTIVES, STEAM

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Vulcan Iron Works, Wilkes-Barre, Pa.

LOCOMOTIVES, STORAGE BATTERY

General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

LUBRICATORS

Lunkenheimer Co., The, Cincinnati, Ohio
Ohio Grease Co., Loudenville, Ohio

MAGNETIC CONCENTRATORS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MAGNETIC DRUMS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MAGNETS (High Intensity)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MAGNETIC PULLEYS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MAGNETS (Electro)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MAGNETS (Standard and Special)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MATS AND MATTING

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

MILLS, BALL

Hardinge Conical Mill Co., 120 Broadway, New York.
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

"Golden Glow" Headlights



"Golden Glow" Incandescent Headlights project powerful beams of penetrating and non-binding light. Practically no maintenance as compared to arc headlights. Write for catalog.

ELECTRIC SERVICE SUPPLIES CO.

Railway Material and Electrical Supplies

PHILADELPHIA - - - 17 and Cambria Streets
NEW YORK - - - - - 50 Church Street
CHICAGO - - - - - Monadnock Building

EVERLASTING LINE

Cutter Heads,
Chains,
Guides, etc.

For all makes of

Breast and Shortwall Machines

Send for Booklet

FRANK PROX CO.
TERRE HAUTE, IND.



Practical Reasons for AMERICAN MINE DOORS

Every mining man knows that hand operated doors are dangerous and inefficient

Write down all their drawbacks in succession—every one you can think of. The American Mine Door isn't any one of them, but it IS safe and certain at all times.

Doesn't that make it interesting to you? Upon request, we shall be glad to tell you more about it.

THE AMERICAN MINE DOOR CO.
Canton, Ohio

The Roessler & Hasslacher Chemical Company

100 William Street
NEW YORK, N. Y.



Cyanide of Sodium

96-98%

Cyanogen contents 51-52%

"Cyanegg"

or Cyanide of Sodium 96-98% in egg form, each egg weighing approximately one ounce.

MILLS, STAMP

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Mine Equipment & Supply Co., Denver, Colo.

MILLS, TUBE

Hardinge Conical Mill Co., 120 Broadway, New York City.

MINE DOORS, AUTOMATIC

American Mine Door Co., Canton, Ohio

MINING DRILL STEEL (Hollow and Solid)

International High Speed Steel Co., 294 Lafayette St., New York City

MINING MACHINES

Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago, Ill.

MINING MACHINES CHAIN AND PUNCHER

Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

MINING MACHINES (Electric)

Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

MINING MACHINERY

H. Channon Co., Chicago, Ill.
Denver Rock Drill Mfg. Co., Denver, Colo.
Machinery, Warehouse & Sales Co., Chicago, Ill.
Marion Machine, Foundry & Supply Co., Marion, Ind.
Mine Equipment & Supply Co., Denver, Colo.

MINE CAR HITCHINGS

Hockensmith Wheel & Mine Car Co., Penn Station, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.

MINE CAR TRUCKS

Hockensmith Wheel & Mine Car Co., Penn Station, Pa.

MINERAL MAGNETIC SEPARATORS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

MINE SIGNALS

American Mine Door Co., Canton, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

MINE SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

MINING EQUIPMENT

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Marion Machine, Foundry & Supply Co., Marion, Ind.
Mine & Smelter Supply Co., Denver, Colo.

MINING MACHINE ROPE

Macomber & Whyte Rope Co., Kenosha, Wis.

MOTORS

General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

OIL AND GREASE CUPS

Lunkenheimer Co., The, Cincinnati, Ohio
Ohio Grease Co., Loudenville, Ohio

ORE, BUYERS AND SELLERS OF

Illinois Zinc Co., Peru, Ill.
Irvington Smelting and Refining Works, Irvington, N. J.
Phelps, Dodge Corporation, New York City

ORE CRUSHERS

Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

ORE FEEDERS

Denver Quartz Mill & Crusher Co., Denver, Colo.
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

ORE SAMPLERS

Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., Inc., 99 John Street, New York
Lucius Pitkin, Inc., 47 Fulton Street, New York

ORE SEPARATORS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

PERFORATED METALS

Chicago Perforating Co., Chicago, Ill.
Laubenstein Mfg. Co., Ashland, Pa.

PICKING TABLES

Willis E. Holloway Co., Cleveland, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

PIPE, CAST IRON

Hockensmith Mine Car Co., Penn Station, Pa.

PIPE (Wood)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Mine & Smelter Supply Co., Denver, Colo.
Pacific Tank & Pipe Co., San Francisco, Cal.

PORTABLE LAMP GUARDS

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

PORTABLE WOOD HANDLE LAMP GUARD

Flexible Steel Lacing Co., 522 S. Clinton St., Chicago, Ill.

POWER SHOVELS

Thew Automatic Shovel Co., Lorain, Ohio.

POWER TRANSMISSION MACHINERY

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

PROSPECTING DRILLS

Hoffman Brothers, Punxsutawney, Pa.
Longyear Company, F. J., Minneapolis, Minn.

PULLEYS (Magnetic)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

PULVERIZERS, COAL AND COKE

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

PUMPS, CENTRIFUGAL

Aldrich Pump Co., Allentown, Pa.
Novo Engine Co., Lansing, Mich.
United Iron Works Co., Kansas City, Mo.

PUMPS, MILL

Aldrich Pump Co., Allentown, Pa.
The Deming Co., Salem, Ohio
Mine & Smelter Supply Co., Denver, Colo.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.

PUMPS, MINE

Aldrich Pump Co., Allentown, Pa.
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
The Deming Co., Salem, Ohio
Mine & Smelter Supply Co., Denver, Colo.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
United Iron Works, Kansas City, Mo.

FOR SALE

Some of Our Guaranteed Pumps in Stock

- 2-9 x10 Aldrich Triplex Pumps, 400 gallon.
- 1-6 x 8 Gould Triplex Pumps, 125 "
- 1-6 x 8 Deane " "
- 1-5 x 8 Gould " "
- 1-2 1/2 x 6 Platt " "
- 1-5 x 8 Deane " "
- 1-3 1/2 x 4 Stage Byron Jackson Electric Sinking Pump, 125 gallon, 405' head.
- 1-12" Duplex Krogh Centrifugal, 4500 gallon, 150' head.
- 2-7" United Iron Works Centrifugal Pumps.

Also sizes and types--duplex steam pumps

AGENTS

Witte Gasoline and Kerosene Engines

A. H. SIMPSON CO.

MACHINERY—NEW AND USED

129 Fremont Street

SAN FRANCISCO

CALIFORNIA

SOUTHWESTERN ENGINEERING CO.

Incorporated

Engineers and Manufacturers

K & K FLOTATION MACHINE

Efficient, large capacity, relatively less floor space and power.

HAMILL ORE FEEDERS

Absolutely automatic.

MacCAMY INTERCOOLERS

Will increase the efficiency of your air compressor.

The above are worthy of investigation. Let us tell you more. We will be pleased with the opportunity

FLOTATION

and

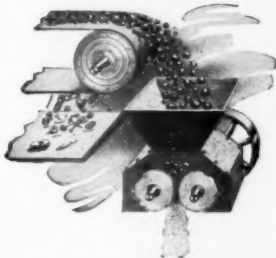
CONCENTRATION

ORE TESTING LABORATORY

Los Angeles

Calif., U. S. A.

DINGS



Magnetic High Intensity Separators

Are successfully handling a large number of complex ores today. We would be interested in testing a sample of your ore. Dings high-intensity Magnetic Separators may have an important place on your flow sheet, simplify your process, or give better extraction. Why not investigate the possibility? Write today.

Dings Magnetic Separator Co.

100 Smith Street MILWAUKEE, WIS.



The Right Man in The Right Place

is the cornerstone of every successful mining enterprise. For sixteen years we have secured competent men for mining employers—

Mine and Mill Superintendents, Assayers, Chemists, Engineers, Draftsmen, Metallurgists, Master Mechanics, Accountants.

Wire or write us regarding your openings.



BUSINESS MEN'S
Clearing House
Denver, Colo., U.S.A.

PUMPS (Electric)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
The Deming Co., Salem, Ohio

PUMPS (Gathering or Dip)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
The Deming Co., Salem, Ohio

PUMPS, PNEUMATIC AIR LIFT

Aldrich Pump Co., Allentown, Pa.
Novo Engine Co., Lansing, Mich.

PUMPS, POWER

Aldrich Pump Co., Allentown, Pa.
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
The Deming Co., Salem, Ohio.
General Electric Co., Schenectady, N. Y.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The 1631 Liberty Avenue, Pittsburgh, Pa.

PUMPS, STEAM

Aldrich Pump Co., Allentown, Pa.
Standard Scale & Supply Co., The 1631 Liberty Avenue, Pittsburgh, Pa.

PUMPS, VACUUM

Aldrich Pump Co., Allentown, Pa.
Mine & Smelter Supply Co., Denver, Colo.

RAILS

Buckeye Rolling Mill Co., Steubenville, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago, Ill.

RAIL BONDS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

RAILWAY SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio

RESPIRATORS

Goodrich Co., The B. F., Akron, Ohio

RAILWAY SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

ROCK CRUSHERS

Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

ROCK DRILLS

Denver Rock Drill Mfg. Co., Denver, Colo.
Sanderson Cyclone Drill Co., Orrville, Ohio.

ROCK DRILLS (Steel)

International High Speed Steel Co., 294 Lafayette St., New York City.

ROLLER BEARINGS

Hyatt Roller Bearing Co., Metropolitan Tower, New York City.

ROPE, MANILA AND JUTE

American Steel & Wire Co., Chicago, New York
Macomber & Whyte Rope Co., Kenosha, Wis.
Roebling Sons, John A., Trenton, N. J.

ROPE, TRANSMISSION

American Steel & Wire Co., Chicago and New York
Hazard Mfg. Co., Wilkes-Barre, Pa.
Roebling Sons, John A., Trenton, N. J.

ROPE, WIRE

American Steel & Wire Co., Chicago and New York
Hazard Mfg. Co., Wilkes-Barre, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.
Roebling Sons, John A., Trenton, N. J.

RUBBER GOODS (Hose, Air Drills, etc.)

H. Channon Co., Chicago, Ill.

SAFETY APPLIANCES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Federal Sign System Chicago, Ill.

SAFETY MAGNETS

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

SAMPLERS OF ORE

Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., Inc., 99 John Street, New York
Lucius Pitkin, Inc., 47 Fulton Street, New York City

SANDERS (Pneumatic Vacuum)**SAW RIGS**

Novo Engine Co., Lansing, Mich.
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SCALES

Standard Scale & Supply Co., The 1631 Liberty Avenue, Pittsburgh, Pa.

SCREENS (Gravity)

Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

SCREENS AND PERFORATED SHEETING

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Perforating Co., Chicago, Ill.
Holmes & Bros., Inc., Robt., Danville, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Laubenstein Mfg. Co., Ashland, Pa.

SCREENS, REVOLVING

Chicago Perforating Co., Chicago, Ill.
Stephens-Adamson Mfg. Co., Aurora, Ill.

SEARCHLIGHTS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SEPARATORS (Electro Magnetic)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

SEPARATORS (Magnetic, Wet)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

SEPARATORS (Steam)

Nicholson & Co., W. H., Wilkes-Barre, Pa.

SHAKER PLATES

Laubenstein Mfg. Co., Ashland, Pa.

SHEAVES (Hoisting)

Marion Machine, Foundry & Supply Co., Marion, Ind.

SHOVELS

Thew Automatic Shovel Co., Lorain, Ohio.

SHOVELS (Steam, Gas and Electric)

Thew Automatic Shovel Co., Lorain, Ohio.

SIGNS (Enameled Steel)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SIGNAL SETS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

AINSWORTH

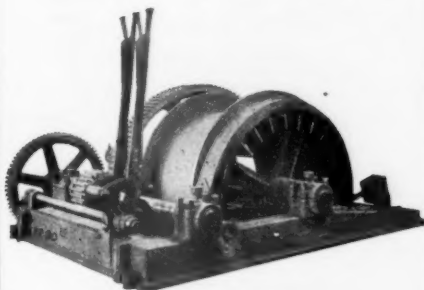
PRECISION BALANCES and ENGINEERING INSTRUMENTS
Are Standard for Accuracy, Workmanship and Finish

Send for Catalog of Balances. Also Catalog of Surveying Instruments and
Bulletin of the Brunton Patent Pocket Transit

WM. AINSWORTH & SONS

DENVER, COLORADO, U. S. A.

BUILD!

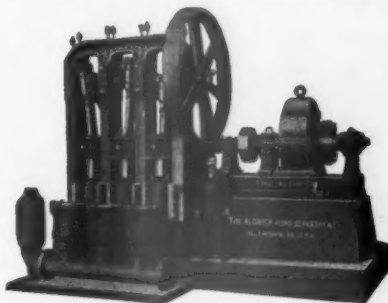


INDUSTRY NEEDS
METALS & COAL

REDUCE HOISTING AND HAULAGE
EXPENSE BY USING

DEWCO ELECTRIC HOISTS
DENVER ENGINEERING WORKS
DENVER, COLO.

Aldrich Pumps FOR MINE SERVICE



Here is an illustration of a 12"x16" triplex having
a rated capacity of 1200 gallons per minute against
a working head of 350 feet. Pump is fitted with
cement-lined, bronze-fitted water-end and plungers
of chilled iron for handling acidulous water.

Write for data

THE ALDRICH PUMP CO.
No. 1 GORDON ST. ALLENTOWN, PA.
CHICAGO NEW YORK CITY PITTSBURGH
McCormick Bldg. No. 30 Church St. Keenan Bldg.

BALLS

We make
"DIAMOND" Brand
FORGED STEEL BALLS
for ball mills

If you want the most serviceable
ball made, get in touch with us

THE MINE EQUIPMENT & SUPPLY CO.
Foster Building, Denver, Colo.

EQUIPMENT USED AND REBUILT

Ready for Delivery: Buckets, Cars,
Compressors, Crushers, Drag-Lines,
Cranes, Hoisting Engines, Steam
Shovels, Rails, (all weights) and
Locomotives.

MACHINERY WAREHOUSE & SALES CO.
Successors to GEO. C. MARSH & CO.
707 Old Colony Bldg., Chicago

SINKERS, ROCK DRILL

Denver Rock Drill Mfg. Co., Denver, Colo.

SMELTERS

Illinois Zinc Co., Peru, Ill.
Irvington Smelting & Refining Works, Irvington, N. J.

SKIPS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

SPELTER

Illinois Zinc Co., Peru, Ill.

SPLICE, CABLE

American Mine Door Co., Canton, Ohio
Ohio Brass Co., Mansfield, Ohio

SPLICE, INSULATOR

American Mine Door Co., Canton, Ohio

SPLICE, TROLLEY WIRE

American Mine Door Co., Canton, Ohio
Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio
Union Electric Co., Pittsburgh, Pa.

SPOUTS (Magnetic)

Dings Magnetic Separator Co., 100 Smith Street, Milwaukee, Wis.

STEAM SHOVELS

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Thew Automatic Shovel Co., Lorain, Ohio.

STEEL BUILDINGS

Stupp Bros. Bridge & Iron Co., St. Louis, Mo.

STEEL (Mining)

International High Speed Steel Co., 294 Lafayette St., New York City.
Stupp Bros. Bridge & Iron Co., St. Louis, Mo.

STEEL PLATE WORK

Stupp Bros. Bridge & Iron Co., St. Louis, Mo.

STEEL (Rock Drill)

International High Speed Steel Co., 294 Lafayette Street, New York.

STEEL, REINFORCING

American Mine Door Co., Canton, Ohio

STOKERS (Hand Fired)

Marion Machine, Foundry & Supply Co., Marion, Ind.

STOPERS, ROCK DRILL

Denver Rock Drill Mfg. Co., Denver, Colo.

STORAGE BATTERIES

Edison Storage Battery Co., Orange, N. J.

STORES (Company Coupons)

Allison Coupon Co., Indianapolis, Ind.

STRUCTURAL STEEL AND IRON

Stupp Bros. Steel & Iron Co., St. Louis, Mo.

SWITCHBOARDS, POWER

General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

SWITCHBOARDS, TELEPHONE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

SWITCHES (Disconnecting and Electric)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SWITCHES, FROGS AND CROSSINGS

Central Frog & Switch Co., Cincinnati, Ohio
Union Electric Co., Pittsburgh, Pa.

SWITCHES AND FROGS, TROLLEY

American Mine Door Co., Canton, Ohio
Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio
Union Electric Co., Pittsburgh, Pa.

TANKS (Cylindrical, Acid Storage Gasoline, Lubricating Oil, etc.)

Mine & Smelter Supply Co., Denver, Colo.
Pacific Tank & Pipe Co., San Francisco, Cal.

TIPPLE EQUIPMENT

Willis E. Holloway Co., Cleveland, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Marion Machine, Foundry & Supply Co., Marion, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

TRACKS, PORTABLE, RAIL, ETC.

Central Frog & Switch Co., Cincinnati, Ohio
West Virginia Rail Co., Huntington, W. Va.

TRANSFORMERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

TRAPS

Nicholson & Co., W. H., Wilkes-Barre, Pa.

TRIPLEX PUMPS

A. H. Simpson Co., 129 Fremont St., San Francisco, Cal.

TROLLEY FROGS

Central Frog & Switch Co., Johnstown, Pa.

TROLLEY (Hangers and Clamps)

Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio

TROLLEY MATERIAL, OVERHEAD

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio

TROLLEY WHEELS AND HARPS

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

TRUCKS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

TURBINES, STEAM

General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

VALVES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Lunkenheimer Co., The, Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio

Deming

MINE PUMPS

For All Mine Pumping Requirements

The Deming Company
Salem Ohio



Just an Idea of the Scope of
MASSCO SERVICE
For the Mill—Wilfley Tables,
Marcy Mills

For the Mine—Sackett Sand Pumps,
Goulds Pumps

For the Laboratory—Clay Goods, Pulverizers
In addition to a complete line of standard
equipment



**MINE AND SMELTER
SUPPLY COMPANY**

Denver

Salt Lake City
New York Office, 42 Broadway

El Paso

BALANCES AND WEIGHTS

for Scientific Purposes

Made by
THOMPSON BALANCE CO.
Denver, Colorado

General Briquetting Company

CONSULTING ENGINEERS

25 Broad Street

NEW YORK

Specialists in the Briquetting of Ores, Coals,
Lignites, Metals, Concentrates, etc.

PENNSYLVANIA SMELTING CO.

PITTSBURGH, PA.

WORKS: CARNEGIE, PA.

P. C. C. & St. L. R. R.

PIG LEAD

Robert W. Hunt

Jas. C. Hallsted

Jno. J. Cone

D. W. McNaughton

ROBERT W. HUNT & CO.

Engineers

Bureau of Inspection, Tests and Consultation

2200 Insurance Exchange.

Chicago

Mining Engineers and Chemists

Inspection Construction Materials and
Machinery at Point of Manufacture.

WATER

WE-FU-GO AND SCAIFE

**PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES**

WM. B SCAIFE & SONS CO. PITTSBURGH, PA.

Wilmot Engineering Company

Hazleton, Pennsylvania

Manufacturers of

Improved Breaker Machinery
for Conveying, Crushing, Sizing
and Cleaning Anthracite Coal

WAGON LOADERS

Jeffrey Mfg. Co., 958 N. Fourth
Street, Columbus, Ohio

**WATER SOFTENING AND
PURIFYING APPARATUS**

Wm. B. Sealife & Sons Co., Oak-
mont, Pa.

WEIGHERS

Indiana Laboratories Co., Ham-
mond, Ind.

Ledout & Co., Inc., New York

Lucius Pitkin, Inc., 47 Fulton
Street, New York

WEIGHTS

Ainsworth, Wm., & Son, Denver,
Colo.

**WELL-DRILLING MACHIN-
ERY AND TOOLS**

The Sanderson Cyclone Drill Co.,
Orrville, Ohio.

**WET M A G N E T I C
SEPARATORS**

Dings Magnetic Separator Co., 100
Smith Street, Milwaukee, Wis.

WIRE AND CABLE

American Steel & Wire Co., Chi-
cago; New York

Hazard Mfg. Co., Wilkes-Barre, Pa.

Roebling Sons, The John A., Tren-
ton, N. J.

United States Rubber Co., New
York City.

**WORMS (Worm Wheel and
Racks)**

Electric Service Supplies Co., 17th
& Cambria Sts., Philadelphia, Pa.

ZINC (Rolled Sheets and
Strips)

Illinois Zinc Co., Peru, Ill.

At Your Service

If You Have

Business in Washington with any of the govern-
ment departments, the American Mining Congress
will be glad to serve its active members without
charge, in any way consistent with its purposes,
either in obtaining information, securing public
documents, in advising as to the progress of legis-
lation or in the consideration of complaints.

The American Mining Congress is an organization
of service. Write us how we may serve you.

The American Mining Congress

Munsey Bldg.

Washington, D. C.

LEDOUX & COMPANY,
Inc.
NEW YORK

**Sample and Assay Ores and
Metals**

Having representatives at buyers' works we receive, weigh, sample and assay consignments representing the sellers in all transactions. We are not dealers or refiners.

Laboratory and Office: 99 John Street

LUCIUS PITKIN, Inc.
Chemists

**Weighers, Samplers and Assayers of
ORES and METALS**

We represent sellers at the receiving works and take full charge of their consignments.

ADDRESS:

47 Fulton St., New York City, N. Y.

Phelps Dodge Corporation

99 JOHN STREET
NEW YORK

COPPER

"C * Q"
ELECTROLYTIC

"P. D. Co."
CASTING

E. J. LONGYEAR COMPANY
Exploring Engineers

Diamond Drill Contractors and
Manufacturers

Examination

Exploration
and Development
of
Mineral Lands

MINNEAPOLIS

MINNESOTA

ILLINOIS ZINC COMPANY
PERU, ILLINOIS

Manufacturers of

Selected Brass SPELTER, Sulphuric Acid
Rollers of ZINC in SHEETS
PLATES and STRIPS

Special sizes of zinc cut to order in squares and circles, battery plates, etchers', engravers' and lithographers' plates. Paper and card makers' sheets.

W. Fisher, Eastern Sales Agent
203 Broadway
Tel. Cortland 1981 NEW YORK

**Irvington Smelting and
Refining Works**

*Buyers, Smelters and Refiners of
Gold, Silver, Lead, Copper and Platinum
Ores, Sweeps and Bullion*

Manufacturers of Copper Sulphate

IRVINGTON :: :: NEW JERSEY

N. Y. OFFICE—Charles Engelhard
Hudson Terminal Building 30 Church Street

HAMILTON, BEAUCHAMP, WOODWORTH, Inc.
METALLURGICAL ENGINEERS

SPECIALTY: THE TREATMENT OF GOLD AND SILVER ORES, BY FLOTATION, BY CYANIDE, OR BY A COMBINATION OF BOTH PROCESSES

Flotation of Copper, Lead, Zinc, and Other Minerals

Tests made on Lots of 1 lb. up to 5 Tons
MILLS DESIGNED AND CONSTRUCTED, CONSULTING AND EXPERT WORK UNDERTAKEN
Laboratory and Office: 419 The Embarcadero, San Francisco
Telephone: Sutter 5266 Cable Address: Hambeau
Codes: West. Union; Bed. McNeill

Janney FLOTATION MACHINES

are made in two sizes: The "Little" Janney for mills treating up to 100 tons of ore per day, and the "Standard" for mills treating 100 tons or more per day. They get the last possible pound of mineral and produce a high grade concentrate.

Both are adaptable to treatment of all ores amenable to flotation.

The Janney patented circulating feature has a similar effect upon flotation to that obtained by having a screened or classified circulating load through any crushing medium.

We make a specialty of testing ores by flotation. Send for illustrated booklets.

Manufactured and Sold Exclusively by
STIMPSON EQUIPMENT CO.
Felt Building, Salt Lake City, Utah

The American Mining Congress

THE AMERICAN MINING CONGRESS is a voluntary association supported by the fees and dues of its members. It is striving to bring about:

First—Safety and efficiency in mining operations.

Second—Intelligent conservation with a view to the highest utilization and the prevention of waste of mineral resources.

Third—The protection of mining investors against fraud and misrepresentation; the stimulation of investment in real mining and to demonstrate that mining is a business and not a gamble.

Fourth—Uniformity in state laws governing mining operations carried on under like conditions.

Fifth—Such federal cooperation through research and investigation as will solve those problems of production, treatment and transportation which are essential to the highest development of the Mining Industry.

Sixth—A solution of the economic problems underlying the coal industry.

Seventh—A more complete cooperation between miner and operator through the settlement of disputes by the economical rule of reason, rather than by the wasteful method of strikes and lockouts, and to foster in every possible way those conditions which make for just, considerate and helpful employers and well paid, efficient and loyal workmen.

If you are interested in this work, the appended application blank will show the way to help. Come in and bring the neighbor who would join this movement. Mail application to

THE AMERICAN MINING CONGRESS

Munsey Building, Washington, D. C.

APPLICATION FOR MEMBERSHIP

I desire to be enrolled as a member of the

AMERICAN MINING CONGRESS

and herewith enclose \$.....membership fee and dues for the year 1919 (\$2.00 of which is designated as subscription to the MINING CONGRESS JOURNAL).

Name

Address.....

Associate membership	(Admission fee \$1.00	Annual dues \$2.00)	Total \$3.00
Active	" (" " 15.00	" " 10.00)	" 25.00
Life	" - - - - -	- - - - -	100.00

The Indiana Laboratories Co.
Incorporated
Chemists, Assayers, Engineers, Shippers'
Representatives
Hammond, Ind. Philipsburg, Mont.

SULPHURIC ACID CHEMICALS
CHEMICALLY PURE ACIDS AND AMMONIA
For Assaying and Fine Chemical Analysis
Manufactured by
THE WESTERN CHEMICAL MFG. CO.
Ask your dealer DENVER, COLO.

RICHARDS, J. W.
ASSAYER AND CHEMIST
1118 Nineteenth St., Denver
Ore Shippers' Agent. Write for terms.
Representatives at all Colorado smelters.

W. H. NICHOLSON & CO.
Manufacturers of
Wyoming Automatic Eliminators,
Steam Traps and Steam Separators,
particularly adapted for mine service.
Wilkes-Barre, Penna.

SCREENS OF ALL KINDS
Chicago Perforating Co.
2443 West 34th Place
Tel. Canal 1459 CHICAGO, ILL.



JOHN HERMAN, B.S.C.
SCREENING BALL MILLS
Ore testing and Assaying
514 S. L. A. Los Angeles, Cal.

SEELEY W. MUDD, Mining Engineer
1208 Hollingsworth Building Los Angeles, Cal.
Code: Bedford McNeill

W. L. PIERS
ASSAYER AND CHEMIST
RARE METALS AND ANALYSES
428 Eighteenth St. Denver, Colo.

Orvis C. Hoffman Leon H. Hoffman
DIAMOND CORE DRILLING
— CONTRACTORS —
HOFFMAN BROS.
PUNXSUTAWNEY, PA.
(Our Specialty—Testing Bituminous Coal Lands)
Up-To-Date Equipments. Expert Drill Runners. Inquiries Solicited

THE BUCKEYE ROLLING MILL CO.
Main Offices Works
Steubenville, Ohio Newark, Ohio
Light Steel Rails All Sections
12 lb. to 40 lb., inclusive, with accessories
Quick shipment is our specialty

WILLIS E. HOLLOWAY CO.
Engineers and Contractors
ROCKEFELLER BUILDING, CLEVELAND, O.
Tipple Equipment, Picking Tables, Designers of
Plants, Conveyors and Elevators, Coal Handling
Machinery.

TOUT & MCCARTHY, Butte, Mont.
Assayers and Chemists
Assays, Analysis and Tests, Independent Control
Work

BEACH & COMPANY
ORE SAMPLERS AND SHIPPERS AGENTS
Supervise weighing and sampling of ore shipments
to smelters.
Main Office: 204 Boston Bldg., Denver, Col.

CHARLES S. COWAN
ASSAYER & CHEMIST
160 S. West Temple St. Salt Lake City, Utah

R. H. OFFICER & COMPANY
ASSAYERS—CHEMISTS
Salt Lake City, Utah Patronage Solicited

Herbert Goodall Archie J. Goodall
GOODALL BROS., Assayers and Metallurgists
Smelter Shipments Checked Controls a Specialty
38 South Main Street, HELENA, MONTANA

ALONZO F. BARDWELL
ASSAYER AND CHEMIST
Ore Shippers' Agent
158 South West Temple St., Salt Lake City, Utah

AMERICAN MINING CONGRESS

OFFICERS AND COMMITTEES, 1919

OFFICERS

BULKELEY WELLS, President
HARRY L. DAY, Vice-President
M. S. KEMMERER, Second Vice-President
GEORGE H. CROSBY, Third Vice-President
J. F. CALLBREATH, Secretary
JOHN T. BURNS, Assistant Secretary
GEORGE H. BAILEY, Counsel
HAROLD N. LA RIE, Economist
H. W. SMITH, Chief Tariff Division

EXECUTIVE COMMITTEE

BULKELEY WELLS M. S. KEMMERER
E. P. MATHEWSON

DIRECTORS

M. S. KEMMERER, New York
BULKELEY WELLS, Denver, Colo.
W. J. RICHARDS, Pottsville, Pa.
JOHN C. HOWARD, Salt Lake City, Utah
GEORGE H. CROSBY, Duluth, Minn.
SAMUEL A. TAYLOR, Pittsburgh, Pa.
L. A. FRIEDMAN, Lovelock, Nevada
CARL SCHOLZ, Chicago, Ill.
HARRY L. DAY, Wallace, Idaho
CHARLES S. KEITH, Kansas City, Mo.
WALTER DOUGLAS, New York
E. L. DOHENY, Los Angeles, Cal.
E. P. MATHEWSON, New York

COMMITTEES, 1919

STATE VICE-PRESIDENTS,

Alabama.....	J. B. McClary.....	Birmingham
Alaska.....	John A. Davis.....	Fairbanks
Arizona.....	L. S. Cates.....	Ray
Arkansas.....	Ross Blake.....	Cushman
California.....	Geo. W. Starr.....	Grass Valley
Colorado.....	R. S. Ellison.....	Denver
Georgia.....	Geo. L. Pratt.....	Atlanta
Idaho.....	Jerome J. Day.....	Wallace
Indiana.....	J. C. Kolsem.....	Terre Haute
Illinois.....	H. C. Adams.....	Chicago
New Mexico.....	John M. Sully.....	Hurley
New York.....	Sidney J. Jennings.....	New York
Kansas.....	O. M. Bilharz.....	Baxter Springs
Kentucky.....	Alexander Blair, Jr.....	Baskett
Maine.....	C. Vey Holman.....	Rockland
Massachusetts.....	Frank P. Knight.....	Boston
Michigan.....	Gordon R. Campbell.....	Calumet
Minnesota.....	Franklin K. Merritt.....	Minneapolis
Montana.....	James L. Bruce.....	Butte
Missouri.....	Victor Rakowsky.....	Joplin
Nebraska.....	Frank A. Manley.....	Omaha
Nevada.....	C. B. Lakenan.....	McGill
North Dakota.....	Hansen Evesmith.....	Fargo
Ohio.....	W. R. Woodford.....	Cleveland
Oregon.....	H. N. Lawrie.....	Portland
Oklahoma.....	J. F. Robinson.....	Miami
Pennsylvania.....	S. D. Warriner.....	Philadelphia
South Carolina.....	H. L. Scaife.....	Clinton
Tennessee.....	J. M. Overton.....	Nashville
Utah.....	Imer Pett.....	Salt Lake City
Virginia.....	Lee Long.....	Dante
Washington.....	Conrad Wolfe.....	Spokane
Wisconsin.....	O. C. Irwin.....	Berlin
West Virginia.....	Geo. T. Watson.....	Fairmont
Wyoming.....	B. B. Brooks.....	Casper

FEDERAL TAXATION

A. Scott Thompson, *Chairman*..... Miami, Okla.
Paul Armitage..... New York City
John C. Howard..... Salt Lake City, Utah
George E. Holmes..... New York City
E. L. Doheny..... Los Angeles, Cal.

BLUE SKY LEGISLATION

A. G. Mackenzie, *Chairman*..... Salt Lake City, Utah
M. B. Tomblin..... Denver, Colo.
J. E. Curry..... Bisbee, Ariz.
Henry M. Rives..... Reno, Nev.

UNIFORM COAL MINE REPORTS

S. A. Taylor, *Chairman*..... Pittsburgh, Pa.
Carl Scholz..... Chicago, Ill.
A. H. Land..... Huntington, W. Va.
Morton L. Gould..... Indianapolis, Ind.
G. H. Caperton..... Charleston, W. Va.

ALASKAN AFFAIRS

John A. Davis, *Chairman*..... Fairbanks, Alaska
Falcon Joslin..... Seattle, Wash.
Bart L. Thane..... San Francisco, Cal.

WASTING INDUSTRIES

J. F. Callbreath, *Chairman*..... Washington, D. C.
John T. Barnett..... Denver, Colo.
Paul Armitage..... New York City
L. C. Boyle..... Kansas City, Mo.
Rush C. Butler..... Chicago, Ill.

COAL EXPORTS

Dr. Henry M. Payne..... New York City
Van H. Manning..... Washington, D. C.
John C. Callahan..... Washington, D. C.
Allen Walker..... New York City
George M. Dexter..... New York City

COMMITTEES ON FEDERAL LEGISLATION

ALASKA

John A. Davis, *Chairman*..... Fairbanks
John Gross..... Fairbanks
Luther C. Hess..... Fairbanks

ARIZONA

L. S. Cates, *Chairman*..... Ray
Norman Carmichael..... Clifton
Walter Douglas..... Bisbee

COLORADO

John T. Barnett, *Chairman*..... Denver
Nelson Franklin..... Denver
J. F. Welborn..... Denver

GEORGIA

George S. Pratt, *Chairman*..... Atlanta
S. W. McCallie..... Atlanta
B. M. Hall..... Atlanta

IDAHOO

Stanley A. Easton, *Chairman*..... Kellogg
Irvin E. Rockwell..... Bellevue
J. S. McCarthy..... Wallace

ILLINOIS

Albert Nason, *Chairman*..... Chicago
J. K. Dering..... Chicago
F. W. DeWolf..... Urbana



NEW YORK

BUFFALO

Bertha Coal Company

Our interests have been financed principally by large users of coal whose requirements are very large, and we are now in the market for 1,000,000 tons of high grade Pennsylvania, West Virginia, and Ohio coals for which we will pay cash. Write us.

General Offices

CHAMBER OF COMMERCE BUILDING
PITTSBURGH

CLEVELAND

DETROIT

Plants
7

Thru

Southwest

A ROLLER BEARING WHEEL OF STABILITY

THESE NEW PERFECT,
SMOOTH ROLLING—LOW
FRICTION—STICK TO THE
TRACK ROLLER BEARING
WHEELS—SAVE THE CARS
—SAVE THE POWER, SAVE
TIME.

Write for Information

General Offices KANSAS CITY, MO.

"UNITED"
IRON WORKS CO.
"FOR SERVICE"

Management of COAL MINES

"We put the science of thirty six years successful experience in the management of coal mines at the disposal of our clients."

We also finance mines, appraise coal lands, do engineering and supervise construction.

An inquiry will bring an explanation of our service.

PEABODY COAL CO.

332 S. Michigan Avenue
CHICAGO



"Sure Grip" Clamp

To insure uninterrupted service from your trolley lines, use

"Elreco"

line material.

Catalog on request



Combination Mine Hange

ELECTRIC RAILWAY EQUIPMENT CO., Cincinnati, Ohio

COMMITTEES ON FEDERAL LEGISLATION (Continued)

INDIANA

J. C. Kolsem, *Chairman*.....Terre Haute
Morton L. Gould.....Indianapolis
Philip Penna.....Terre Haute

KENTUCKY

Frank D. Rash, *Chairman*.....Earlington
F. P. Wright.....Bevier
W. G. Duncan.....Greenville

MASSACHUSETTS

W. R. Allen, *Chairman*.....Boston
Frank P. Knight.....Boston
Charles S. Smith.....Boston

MICHIGAN

Gordon R. Campbell, *Chairman*.....Calumet
Charles Briggs.....Calumet
W. J. Uren.....Houghton

MINNESOTA

Charles W. Potts, *Chairman*.....Deerwood
Francis J. Webb.....Duluth
Earl Hunner.....Duluth

MISSOURI

H. N. Taylor, *Chairman*.....Kansas City
C. F. Dyke.....Joplin
J. M. Hoffman.....Kansas City

MONTANA

C. F. Kelley, *Chairman*.....Butte
James L. Bruce.....Butte
Oscar Rohn.....Butte

NEVADA

C. B. Lakenan, *Chairman*.....McGill
Emmet D. Boyle.....Carson City
Victor Barndt.....Tonopah

NEW MEXICO

T. H. O'Brien, *Chairman*.....Dawson
John Sully.....Hurley
G. A. Kaseman.....Albuquerque

NEW YORK

Sidney J. Jennings, *Chairman*.....New York City
William Young Westervelt.....New York City
S. B. Thorne.....New York City

OHIO

H. E. Willard, *Chairman*.....Cleveland
W. R. Woodford.....Cleveland
A. A. Augustus.....Cleveland

OREGON

John Haak, *Chairman*.....Portland
H. N. Lawrie.....Portland
H. M. Parks.....Portland

UTAH

Imer Pett, *Chairman*.....Salt Lake City
John C. Howard.....Salt Lake City
Walter Fitch.....Eureka

VIRGINIA

Otis Mouser, *Chairman*.....Big Stone Gap
Lee Long.....Dante
Otto Stange.....Narrows

WASHINGTON

William A. Nichols, *Chairman*.....Spokane
W. H. Seagraves.....Seattle
W. G. Collins.....Seattle

WEST VIRGINIA

Daniel C. Howard, *Chairman*.....Clarksburg
S. D. Brady.....Fairmont
G. H. Caperton.....Charleston

WISCONSIN

John M. Whitehead, *Chairman*.....Janesville
George S. Whyte.....Kenosha
H. C. George.....Plattsville

WYOMING

C. R. Hagens, *Chairman*.....Casper
W. D. Brennan.....Rock Springs
E. J. Sullivan.....Basin

COMMITTEES ON STATE LEGISLATION

ALASKA

Paul Hopkins, *Chairman*.....Fairbanks
J. A. Haney.....Fairbanks
J. C. Kinney.....Fairbanks

ARIZONA

W. H. Gohring, *Chairman*.....Bisbee
Gerald Sherman.....Bisbee
J. E. Curry.....Bisbee

CALIFORNIA

L. D. Gordon, *Chairman*.....San Francisco
W. P. Netherton.....Santa Cruz
Roy N. Bishop.....San Francisco

COLORADO

George M. Taylor, *Chairman*.....Colorado Springs
William Loach.....Boulder
T. A. Dines.....Denver

IDAHO

D. W. Greenburg, *Chairman*.....Wallace
Eugene Thomas.....Mullan
G. Scott Anderson.....Wallace

INDIANA

Philip Penna, *Chairman*.....Terre Haute
J. C. Kolsem.....Terre Haute
Morton L. Gould.....Indianapolis

KENTUCKY

C. M. Roehrig, *Chairman*.....Ashland
Frank D. Rash.....Earlington
Alexander Blair, Jr.....Baskett

MASSACHUSETTS

Frank P. Knight, *Chairman*.....Boston
W. R. Allen.....Boston
Charles S. Smith.....Boston

MICHIGAN

M. E. Richards, *Chairman*.....Crystal Falls
D. H. Campbell.....Iron River
O. C. Davidson.....Iron Mountain

MINNESOTA

Francis J. Webb, *Chairman*.....Duluth
W. G. Swart.....Duluth
E. J. Maney.....Duluth

MISSOURI

D. D. Hoag, *Chairman*.....Joplin
A. J. Burnham.....Webb City
Harlan H. White.....Joplin

NEVADA

Henry M. Rives, *Chairman*.....Reno
C. B. Lakenan.....McGill
A. A. Codd.....Reno

NEW MEXICO

T. H. O'Brien, *Chairman*.....Dawson
J. B. Morrow.....Dawson
A. J. Inderrieden..... Lordsburg

OREGON

H. M. Parks, *Chairman*.....Portland
H. N. Lawrie.....Portland
John H. Haak.....Portland

TENNESSEE

W. H. Lindsey, *Chairman*.....Nashville
C. C. Houston.....Lewisburg
W. Y. Davey.....Johnson City

COMMITTEES ON STATE LEGISLATION (Continued)

UTAH

A. G. Mackenzie, *Chairman*.....Salt Lake City
George H. Dern.....Salt Lake City
G. W. Lambourne.....Salt Lake City

VIRGINIA

Lee Long, *Chairman*.....Dante
Otis Mouser.....Big Stone Gap
Otto Stange.....Narrows

WASHINGTON

Sidney Norman, *Chairman*.....Spokane
William A. Nichols.....Spokane
Conrad Wolfe.....Spokane

WEST VIRGINIA

W. Gaston Caperton, *Chairman*.....Slab Fork
C. H. Jenkins.....Fairmont
Harry B. Clark.....Fairmont

WISCONSIN

H. O. Granberg, *Chairman*.....Oshkosh
John M. Whitehead.....Janesville
H. C. George.....Plattville

WYOMING

John Hay, *Chairman*.....Rock Springs
C. A. Barnard.....Gebo
Q. K. Deaver.....Casper

Laubenstein Manufacturing Company

Manufacturers of
**PERFORATED.
METAL PLATES**

ASHLAND

PENNA.



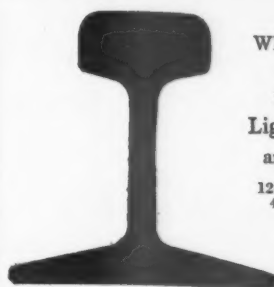
INVESTIGATE The Bryan Process

Volumetric Sizing Preceding
Dry or Wet Concentration

Mills Designed and Installed
Concentration Tests Made

THE MINERALS RECOVERY COMPANY

1734 Glenarm St., Denver, Colo., U. S. A.



The WEST VIRGINIA RAIL CO.

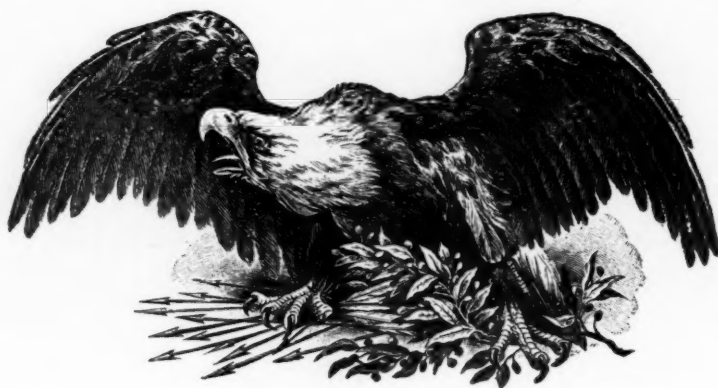
Manufacturers
**Light Steel Rails
and Accessories**

12, 16, 20, 25, 30, 35,
40, 45 lbs. per yd.

Mills and General
Offices
Huntington,
W. Va.

**ADVERTISEMENTS IN THE
Mining Congress Journal
IDENTIFY YOU**

THE FIGHTING EAGLE OF AMERICA



THE FIGHTING ORGANIZATION OF
THE MINING INDUSTRY

THE
AMERICAN MINING CONGRESS

INDEX TO ADVERTISERS

Ainsworth, Wm., and Sons.....	45	Laubenstein Mfg. Co.....	55
Aldrich Pump Co.....	45	Longyear Co., E. J.....	49
Allis Chalmers Mfg. Co.....	14	Lehigh Coal & Navigation Co.....	58
Allison Coupon Co.....	39	Ledoux & Company.....	49
Ameling, H. R., Prospecting Co.....	8	Lunkenheimer Co.....	55
American Mine Door Co.....	41	Machinery Warehouse & Sales Co.....	45
American Steel & Wire Co.....	6	Macomber & Whyte Rope Co.....	12
Atlas Car & Mfg. Co.....	16	Marion Machine Foundry & Supply Co.....	37
Atlas Powder Co.....	25	Mikesell Brothers.....	39
Automatic Reclosing Circuit Breaker Co.....	39	Mine & Smelter Supply Co.....	47
Bardwell, Alonzo F.....	51	Mine Equipment & Supply Co.....	45
Beach & Company.....	51	Minerals Recovery Co.....	55
Bertha Coal Co.....	53	Morse Chain Company.....	17
Buckeye Rolling Mill Co.....	51	Mudd, Seeley W.....	51
Business Men's Clearing House.....	43	National Fuse & Powder Co.....	20
Central Frog & Switch Co.....	37	Nicholson & Co., W. H.....	51
Channon Company, H.....	6	Officer & Co., R. H.....	51
Chicago Belting Co.....	24	Ohio Brass Co.....	35
Chicago Perforating Co.....	51	Pacific Tank & Pipe Co.....	33
Connellsville Mfg. & Mine Supply Co.....	35	Peabody Coal Co.....	53
Cowan, Charles S.....	51	Pennsylvania Smelting Co.....	47
Deming Company, The.....	47	Phelps Dodge Corp.....	49
Denver Engineering Works.....	45	Piers, W. L.....	51
Denver Rock Drill Mfg. Co.....	19	Pitkin, Inc., Lucius.....	49
Dings Magnetic Separator Co.....	43	Pneumelectric Machine Co.....	10
The Duquesne Electric & Mfg. Co.....	37	Prox Co., Frank.....	41
E. I. DuPont de Nemours & Co.....	23	Richards, J. W.....	51
Edison Storage Battery Co.....	Cover	Roebblings Sons Co., John A.....	12
Electric Railway Equipment Co.....	53	Roessler & Hasslacher Chemical Co.....	41
Electric Service Supplies Co.....	41	Ruhl & Stewart.....	51
Equitable Powder Co.....	20	Sanderson Cyclone Drill Co.....	8
Flexible Steel Lacing Co.....	35	Scaife & Sons Co., Wm. B.....	47
General Briquetting Co.....	47	Simpson Co., A. H.....	43
General Electric Co.....	29	Southwestern Engineering Co.....	43
Goodin, Reid & Co.....	14	Standard Scale & Supply Co.....	20
Goodman Mfg. Co.....	27	Stephens-Adamson Mfg. Co.....	30
Goodrich Rubber Co., B. F.....	11	Sunlight Electric Mfg. Co.....	37
Hamilton, Benuechamp, Woodworth, Inc.....	49	Stimpson Equipment Co.....	49
Hardinge Conical Mill Co.....	31	Stupp Bros. Bridge & Iron Co.....	35
Hazard Mfg. Co.....	12	Thew Automatic Shovel Co.....	19
Hercules Powder Co.....	28	Thompson Balance Co.....	47
Herman, John.....	51	Thorne-Neale & Co.....	58
Hockensmith Wheel & Mine Car Co.....	33	Tout & McCarthy.....	51
Hoffman Brothers.....	51	United Metals Selling Co.....	16
Holloway Co., Willis E.....	51	Union Electric Co.....	33
Holmes & Bros. Inc., Robert.....	10	United Iron Works Co.....	53
Hunt & Co., Robert W.....	47	U. S. Rubber Co.....	Cover
Hyatt Roller Bearing Co.....	3	Vulcan Iron Works.....	7
Illinois Zinc Co.....	49	Watt Mining Car Wheel Co.....	21
Indiana Laboratories Co., Inc.....	51	Western Chemical Mfg. Co.....	51
International High Speed Steel Co.....	4	Westinghouse Electric & Mfg. Co.....	9
Ironton Engine Co.....	15	West Virginia Rail Co.....	55
Ivington Smelting & Refining Works.....	49	Williams, J. W.....	51
Jeffrey Mfg. Co.....	Cover	Wilnot Engineering Co.....	47

Thorne, Neale & Company

(Incorporated)

FRANKLIN BANK BUILDING

1416 CHESTNUT STREET (9.00 A. M.-4.00 P. M.)

PHILADELPHIA, PA.

Miners' Agents and Wholesale Dealers

ANTHRACITE and BITUMINOUS

COAL

Shipments via all Railroads, All Piers

New York Office: No. 17 Battery Place

Branch Offices:

Baltimore

Chicago

Mauch Chunk, Pa.

Boston

Buffalo

Altoona, Pa.

THE LEHIGH COAL AND NAVIGATION COMPANY

MINERS OF



ANTHRACITE COAL

“The Best Since 1820”

437 CHESTNUT STREET
PHILADELPHIA, PENNSYLVANIA



After the storm---the rainbow.

After the usual run of transmission
troubles and belting experiments---
Rainbow Friction Surface Belting.

The engineer will tell you why.

**"The Right Belting
in the Right Place."**

United States Rubber Company



How a Prominent Pennsylvania Operator Reduced Power Consumption Over Two- thirds by Installing a Jeffrey Stepped Multi-Bladed Fan



A six-foot Jeffrey fan at Ernest No. 1 Mine of the Jefferson Clearfield Coal & Iron Company, Indiana, Pa., reduces their power consumption over two-thirds. The sixteen-foot fan shown in the background required 127 H. P. to deliver 64,000 cu. ft. The six-foot Jeffrey fan required 102 H. P. to deliver 91,000. Using the well-known formula that the power varies as the cube of volume, it is found that the sixteen-foot fan would consume 365 H. P., as against 102 H. P. for the Jeffrey fan.

**Over 1,000
Jeffrey
Mine Fans
installed
during the
past three
years**

This is only one of hundreds of installations where the Jeffrey Stepped Multi-Bladed Fan is saving 10-30% a year in power. Every fan sold under a broad guarantee. Write for Bulletin giving particulars of construction and details of many cost-saving installations. There's sure to be one that fits your case.

THE JEFFREY MFG. CO., 958 NORTH 4TH ST., COLUMBUS, OHIO

BRANCHES:

New York	Boston	Charleston, W. Va.	Detroit	Philadelphia	Scranton	Pittsburgh
Chicago	St. Louis	Dallas	Cleveland	Birmingham	Milwaukee	Montreal
Cincinnati	Buffalo				Kansas City	Minneapolis

Denver Office: First National Bank Building

Seattle Office: L. C. Smith Building

